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WAR MACHINE

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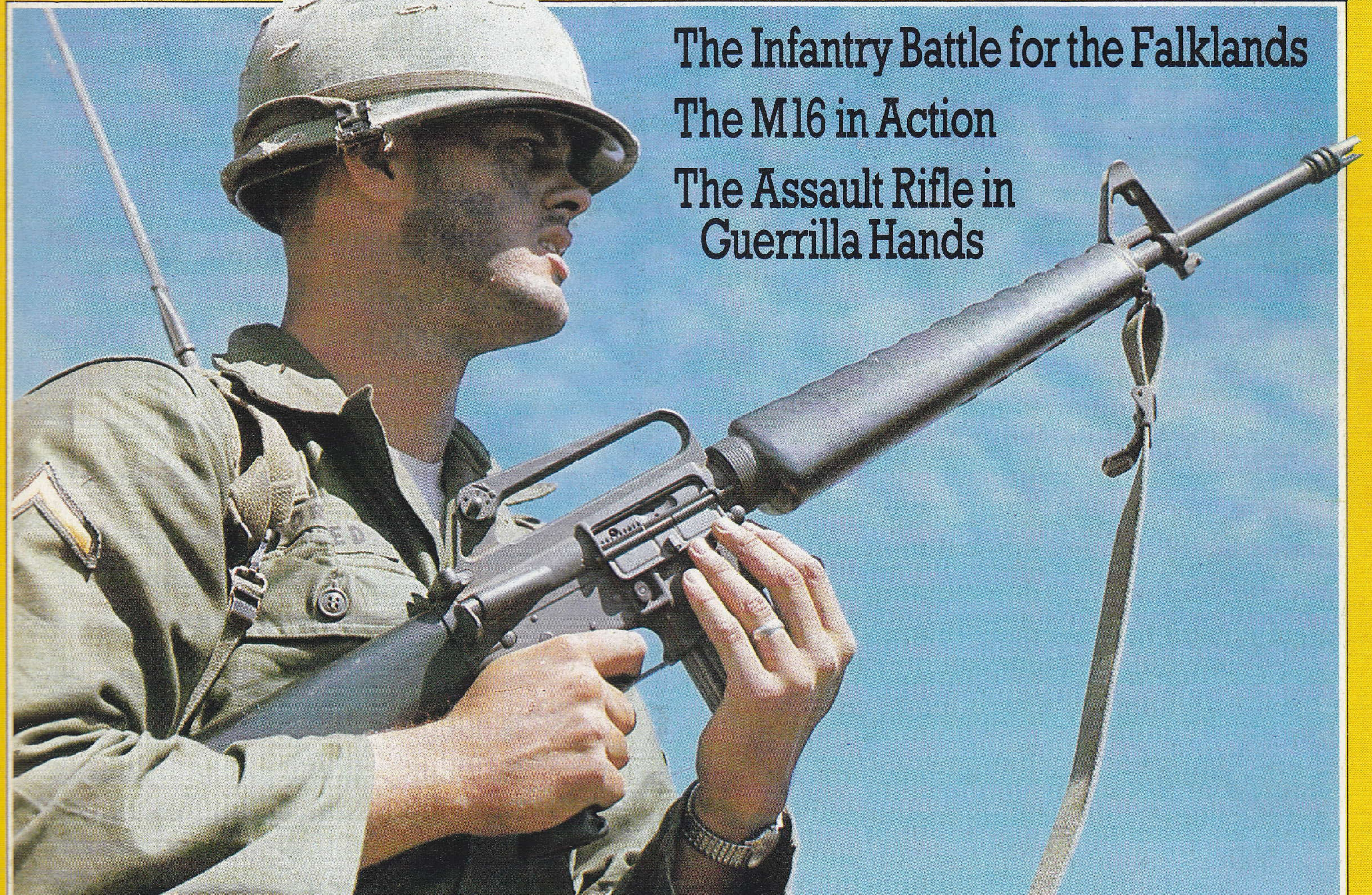

The Infantry Battle for the Falklands

The M16 in Action

The Assault Rifle in Guerrilla Hands

A fully illustrated guide to Modern Assault Rifles

WAR MACHINE

Volume 2 Issue 21

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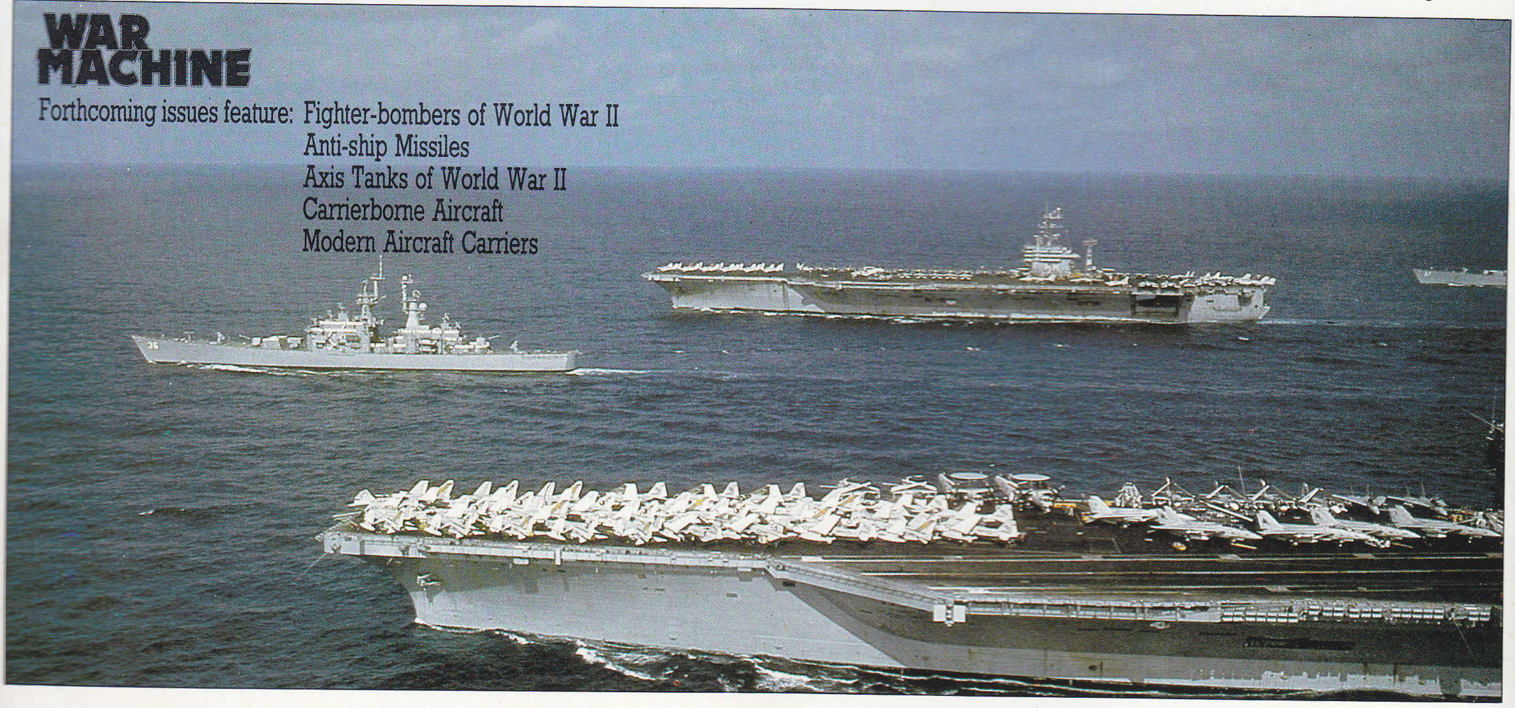


WAR MACHINE

Forthcoming issues feature: Fighter-bombers of World War II
Anti-ship Missiles
Axis Tanks of World War II
Carrierborne Aircraft
Modern Aircraft Carriers

Modern Assault Rifles

Since the turn of the century, and largely as a result of experience gained during colonial wars, conventional military thinking held that the infantry rifle must be accurate at long range. Strangely, the relatively short-range fighting in the trenches of World War I made little impact upon prevailing opinion. As a result of the lessons of the first years of World War II, however, a radical re-appraisal of infantry doctrine was required.

A typical Vietnam situation, with the soldier in the foreground keeping his M16A1 well clear of the water. He is wearing bandoliers of 7.62-mm ammunition for the section M60 machine-gun. In such conditions the light weight and handiness of the modern assault rifle came to the fore.

The modern assault rifle had its roots in the novel art of combat analysis (carried out by the German army after 1939) coupled with ammunition development carried out by the German concern of Polte. The combat analysis revealed that most infantry combats took place at ranges well below 400 m (435 yards), yet the standard infantry rifle of the day was designed to perform at ranges up to over 1000 m (1,095 yards). The short-range combat did not need such a powerful cartridge as the existing rifles so the Polte ammunition developments were studied to reveal a potential cartridge that would be efficient at the short range. The resultant cartridge produced such low recoil forces that automatic fire from a hand-held rifle was possible, and from this the modern assault rifle was born.

The modern assault rifle uses a cartridge that is adequate for infantry combat at ranges up to about 400 m (435 yards) but no more. Most of these cartridges are smaller and lighter than conventional rifle cartridges, and can thus be fired in fully automatic bursts to provide a considerable increase in fire power over single-shot weapons but yet can be used for aimed single-shot fire when required. Since the recoil forces are usually relatively low the construction of the assault rifle need not be very robust, with consequent benefits in light weight and simple mass production methods. For all that some modern assault rifles are very well manufactured and are very robust, though others follow the sheet steel and stampings approach adopted by many of the later sub-machine gun designs.

Tactically the assault rifle has had a considerable impact. A single infantry fire section can now produce fire power that would have been inconceivable only a few years ago and this had led to the fire saturation tactics often employed to neutralize enemy positions and movement. Thus the early promise of lighter ammunition loads for the laden foot soldier has been replaced by extra numerical loads of cartridge carried on the person. But now a relatively small number of men can lay down defensive fire to halt an attack yet advance rapidly firing bursts of automatic fire to overcome opposition; in both cases the expenditure of ammunition can be considerable. In irregular or guerrilla hands the assault rifle is a formidable weapon capable of spraying fire over a lethal radius in a very short time and then vanishing, for the assault rifle is a relatively small weapon.

The assault rifle has largely replaced the sub-machine gun, for the two provide the same product (automatic fire at short ranges for close-quarter combat) yet the assault rifle can also provide useful fire at ranges up to 400 m (435 yards).

British infantry with their L1A1s 'de-bus' from their FV432 armoured personnel carrier. They usually 'de-bus' about 400 m from the enemy position.

AUSTRIA

Steyr 5.56-mm AUG

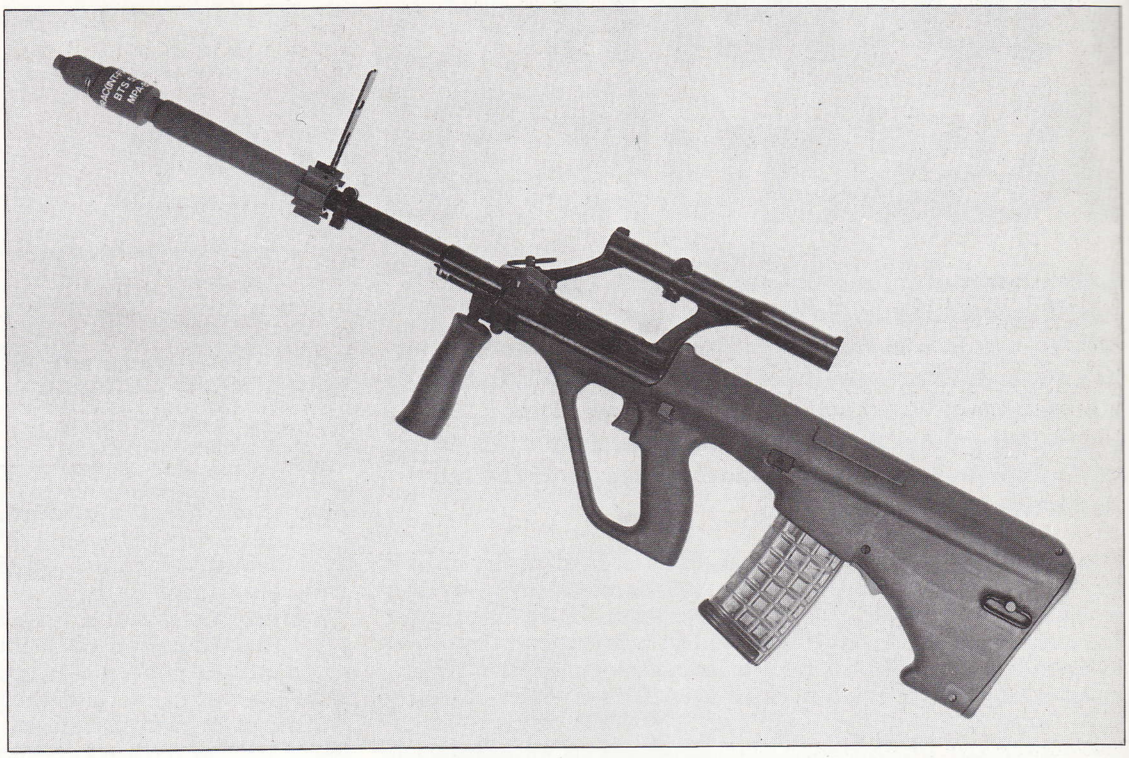
The **Steyr AUG** (Armee Universal Gewehr, or army universal rifle or gun) is one of the most striking in appearance of all the modern assault rifles and it may almost be said to have a 'Star Wars' look about it. It is a 'bull-pup' design weapon, with the trigger group forward of the magazine, which makes it a short and compact weapon. The thoroughly modern appearance is enhanced by the liberal use of nylonite and other non-metallic materials in the construction. The only metal parts are the barrel and the receiver with the internal mechanism; even the receiver is an aluminium casting. All the materials are very high quality of their kind but the non-use of metal has been carried even as far as the magazine which is clear plastic so that the soldier can see at a glance how many rounds the magazine contains.

The Steyr AUG has been designed to be not only an assault rifle, for by varying the barrel length and the fittings on top of the receiver it can be easily produced as a carbine, or a specialist sniper, or a night-action rifle, or even a form of light machine-gun. By changing the fittings on the receiver the AUG can be fitted with a wide range of night sights or sighting telescopes, but the usual sight is a simple optical telescope with a graticule calibrated for normal combat ranges. Stripping the AUG for cleaning is rapid and simple, and cleaning is facilitated by the use of a chromed barrel interior. The AUG has been designed on a modular system so repairs can be easily effected by changing an entire module such as the trigger group, bolt group etc.

Production of the AUG began in 1978, and since that date the Steyr production line has been kept busy supplying the Austrian army, various Middle East states and some South American armed forces. Production is still well under way with no signs of the market weakening, and the AUG seems set for a long future.

Specification

Steyr AUG (assault rifle version)
Calibre: 5.56 mm (0.22 in)
Length: 790 mm (31.1 in)
Length of barrel: 508 mm (20.0 in)
Weight loaded: 4.09 kg (9.02 lb)
Magazine: 30-round box
Rate of fire, cyclic: 650 rpm



Above: The standard Steyr 5.56-mm AUG showing the overall 'bull-pup' layout and the optical sight over the receiver. The weapon has a 40-mm MECAR rifle grenade over the muzzle, which can be fired using normal ammunition to a range of about 100 m; HE, smoke and other grenades can be used.

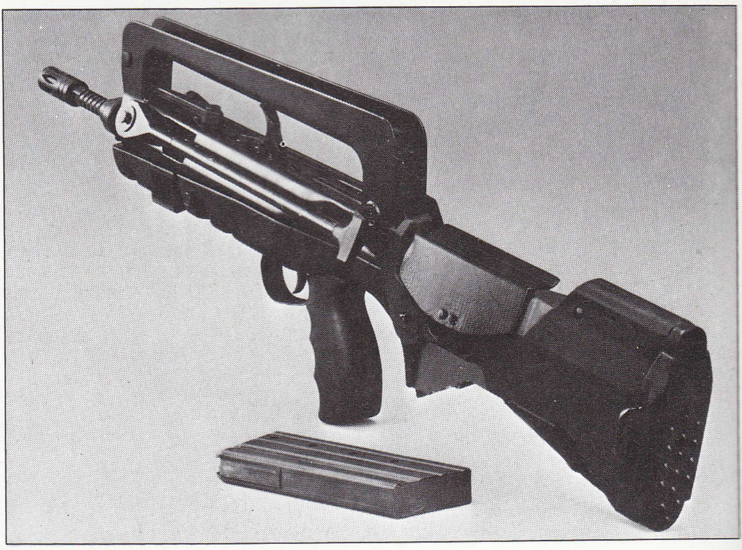
Right: A Steyr 5.56-mm AUG in use by an Austrian soldier. Note the slender barrel with the flash-suppressor/grenade launcher, and how the folding foregrip is easy to hold and use to 'point' the weapon. The ×1 optical sight can be replaced by night sights or image intensifiers for use in poor light.

FRANCE

FA MAS

For some years before and just after World War II the French armaments industry lagged behind the rest of the world in small-arms design, but with the **FA MAS** assault rifle it has made up that leeway with a vengeance. The FA MAS is a thoroughly modern and effective little rifle, and yet another example of the overall compactness that can be achieved by using the unorthodox 'bull-pup' layout with the trigger group in front of the magazine. Even using this design the FA MAS is very short and handy, and must be one of the smallest in-service assault rifle designs of all.

The FA MAS has now been accepted as the standard service rifle for the French armed forces and this alone will keep the weapon coming off the production lines at St Etienne for at least the next 10 years. The first have already been issued to some paratroop and specialist units, and the type was used by French troops in Chad and the Lebanon in 1983. The FA MAS is easy to spot, for in appearance it is quite unlike any other assault rifle. It fires the American M193 5.56-mm cartridge and has over the top of the receiver a long handle that doubles as the rear- and fore-sight base. The butt is prominent and chunky, and from the front protrudes a short length of barrel with a grenade-launching attachment.



The French 5.56-mm FA MAS rifle, one of the smallest and most compact of the modern assault rifles. The magazine has been removed, but note that the carrying handle contains the sights and that the cocking lever is just underneath; note also the folded bipod legs.

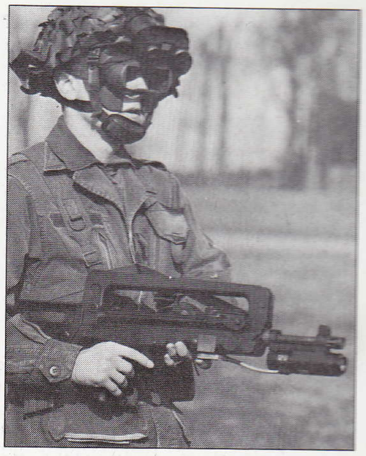
There is provision for a small bayonet and bipod legs are provided as standard. The fire selector has three positions: single-shot, automatic and three-round burst. The mechanism to control this last feature is housed in the butt along with the rest of the rather complex trigger mechanism. The operation is a delayed blow-back system. Use is made of plastics where possible and no particular attention is paid to detail finish: for instance, the steel barrel is not chromed.

Despite its unusual appearance the FA MAS is comfortable to handle and fire, and presents no particular problems in use. Attention has been given to such features as grenade sights and generally easy sighting. In service the weapon has proved to be easy to handle, and training costs have been reduced by the introduction of a version that uses a small sparklet gas cylinder to propel inert pellets for target training; this version is identical to the full service version in every other respect.

The French have offered the FA MAS for export at various defence exhibitions but the production programme for the French armed forces is such that it may be some years before significant numbers appear in service with other nations. Expected to be in the queue are the various ex-French colonies who still look to France for equipment and training.

Specification

Calibre: 5.56 mm (0.22 in)
Length: 757 mm (29.80 in)
Length of barrel: 488 mm (19.21 in)
Weight loaded: 4.025 kg (8.87 lb)
Magazine: 25-round box
Rate of fire, cyclic: 900-1,000 rpm
Muzzle velocity: 960 m (3,150 ft) per second



An FA MAS fitted with a TN$_2$l night sighting infra-red spotlight under the muzzle. This equipment has a useful range of 150 m, and the soldier picks up the infra-red reflections in the night vision binoculars held over his eyes. This equipment is in service with the French army.

BELGIUM/UK

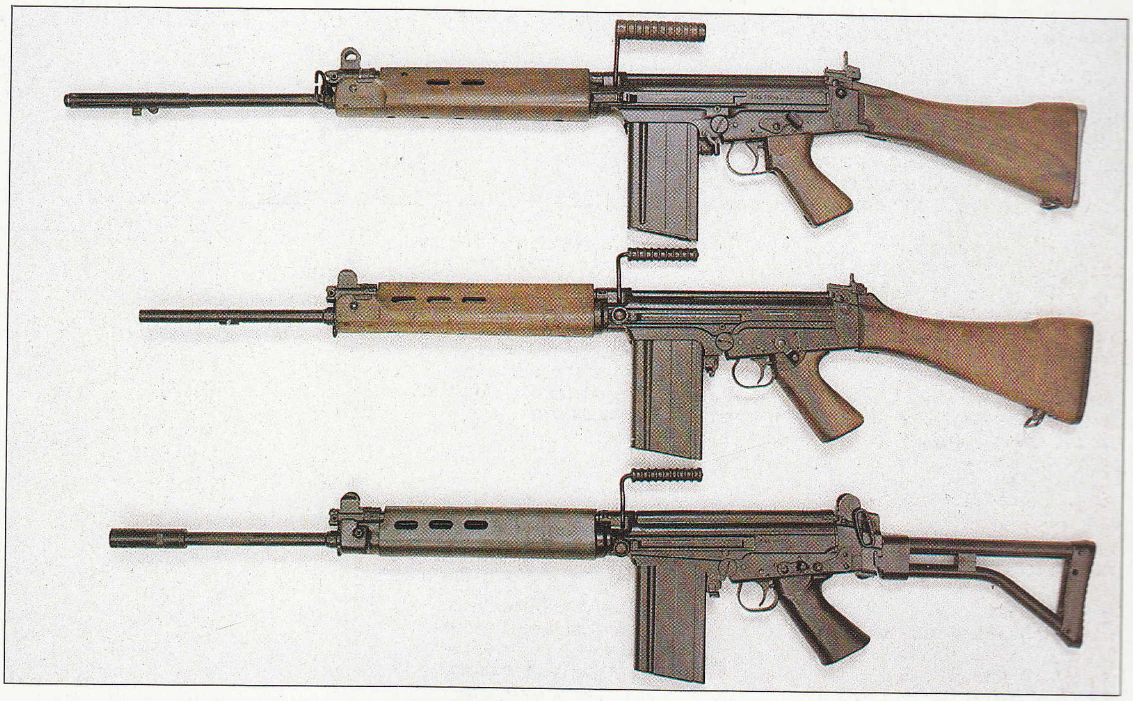
FN FAL and L1A1

Produced by the Belgian concern of Fabrique Nationale, or FN, the rifle now known as the **Fusil Automatique Legère** (FAL, or light automatic rifle) was originally produced in 1948. At that time the prototypes fired the German 7.92-mm×33 *kurz* (short) cartridge but later attempts at NATO ammunition standardization meant that the FAL was eventually chambered for the standard 7.62-mm×51 cartridge. As such it has since been widely adopted, not only throughout NATO but in many other nations, and has even been licence-produced by nations as diverse as South Africa and Mexico. Many of these overseas production models differ in detail from the original FAL but the overall appearance is the same.

The FAL is a sturdy weapon which uses many of the manufacturing methods of a bygone era. High-grade materials are used throughout, and extensive use is made of machining and fine tolerances. The action is gas-operated, using a gas regulation system that taps off propellant gases from above the barrel to operate a piston that pushes back the bolt action for unlocking the breech. The unlocking system has a delay action built in for increased safety. Automatic fire is possible on most models by use of a selector mechanism located near the trigger group.

FAL models are many and various. Most have solid wooden or nylonite butts and other furniture but some models, usually issued to airborne forces, have folding butts that are far sturdier than many other folding butts in use. Overall, sturdiness is a feature of the FAL, for the high manufacturing standards have resulted in a weapon well able to withstand the rigours of service life.

One production version of the FAL that deserves further mention is the British version, known by its service designation **L1A1**. The L1A1 was adopted by the British armed forces only after a lengthy series of trials and modifications that resulted in the elimination of the automatic fire feature, the L1A1 thus firing single-shot only. There are some other differences as well, but the L1A1 itself has been adopted by many other nations, including India where the type is still in production. The Australians also adopted the type and even produced a shorter version, the **L1A1-F1**, to suit the stature of the New Guinea troops.



Top: A British L1A1, the standard British infantry weapon; centre: the FN FAL with a shortened barrel; bottom: an Argentinian FN FAL with folding butt. Note the overall similarity of all these weapons; the bottom two can fire on full automatic, unlike the L1A1.

Both the FAL and the L1A1 are equipped to fire rifle grenades, but these grenades are now little used. Bayonets can also be fitted and some versions of the FAL have heavy barrels and bipods to enable them to be used as light machine-guns. Night sights are another optional fitting.

Although the 7.62-mm FAL is still in production, the trend is now towards a 5.56-mm version and a new model in this calibre is now in production as the **FNC.**

Specification

Calibre: 7.62 mm (0.3 in)
Length: 1143 mm (45.0 in)
Length of barrel: 554 mm (21.81 in)
Weight loaded: 5 kg (11.0 lb)
Magazine: 20-round box
Rate of fire: 30-40 rpm (single shot) or 650-700 rpm (FAL, cyclic)
Muzzle velocity: 838 m (2,750 ft) per second

Australian infantrymen with their locally-produced version of the British L1A1; these rifles were produced at Lithgow in New South Wales. The Australians also produced a short version called the L1A1-F1 for use by local troops in New Guinea. They also use the M16A1.

The Infantry Battle for the Falklands

Much of the campaign to retake the Falklands was fought with the most modern of equipment, ranging from nuclear submarines to satellites. For all that, the decisive qualities which won the infantry campaign would have been familiar to Julius Caesar; the classical virtues of discipline, training, dedication and fitness.

En route for the Falklands, Royal Marines on the deck of HMS Hermes carry out arm-strengthening exercises with their L1A1s, which are minus magazines and slings. Even so, they weigh 4.3 kg, and the exercises enable the Marines to handle their L1A1s even under adverse conditions.

To win in war, the commander must employ carefully co-ordinated efforts of all arms. No one arm can succeed if it operates in isolation. However the repossession of the Falkland Islands in May and June 1982 was essentially an infantry action, albeit heavily dependent on the support of all arms and Services: the 105-mm light guns of the Royal Artillery, the 114-mm (4.5-in) guns of the destroyers and frigates of the Royal Navy, bomb and rocket attacks by Harriers, direct fire support from the armoured vehicles of the reconnaissance troops, mine clearance by the Royal Engineers. Nevertheless it remained up to the infantry, in their classic roles, to close with the enemy, to winkle him out of his positions, and to occupy the ground won.

The beginning

When Argentinian marines and special forces invaded the Falklands on 2 April 1983, defensive action was on a small scale only. The invasion was of such overwhelming strength that the tiny force of Royal Marines could do little to hinder its progress. It did delay the invaders, but the Governor decided that surrender was the only sensible course in the circumstances, and after that the Argentinians had the islands to themselves. They quickly prepared to defend Port Stanley and the major settlements and waited to see what would happen.

They were in for a long wait. Although part of the British Task Force set sail from United Kingdom ports as early as 5 April, it was late May before the leading brigade (3rd Commando Brigade RM) was ready to land, but well before this the first British soldiers were ashore.

In a story that has yet to be fully revealed, patrols of the Special Boat Squadron (SBS) and Special Air Service (SAS) had been landed to gain essential tactical intelligence. Carrying only small arms, they relied upon stealth and expert fieldcraft to avoid detection while they signalled intelligence, reconnoitred potential landing beaches and sought suitable targets for future offensive action. At times too they spotted for Harrier or naval gunfire missions. The best known of the offensive special forces operations was a raid on Pebble Island which, in one hour, destroyed 11 enemy aircraft on the ground at a cost of only two wounded.

While all this important work was in progress, the Task Force sailed south. The troops carried out what training they could on board, mainly weapon training, first aid and physical fitness; and very effective they proved it to have been when they went into action.

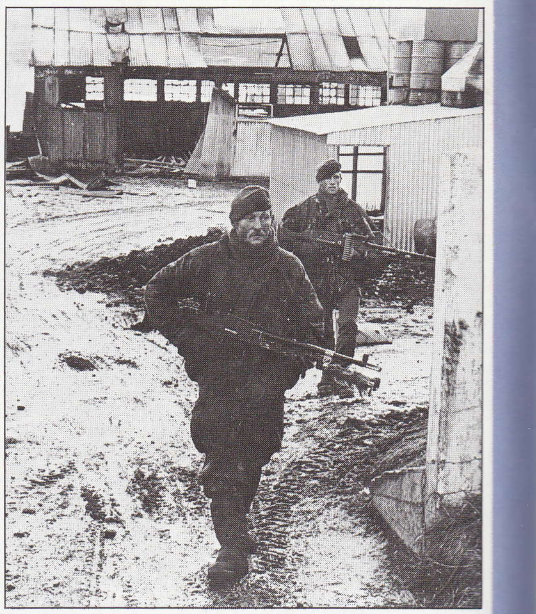
The landings

As is now well known, the landings were made in an area unexpected by the Argentines, around San Carlos Water. They were almost unopposed on the ground, but within hours the air attacks which were expected to drive the British into the sea began. The principal targets were the ships, but the forces ashore suffered too, mostly among the rear echelons, while the infantry units established themselves on the hills overlooking the beach-head. During the following days, while the defences ashore and afloat overcame the Argentine air attacks, stores and ammunition were built up to support the advance.

Darwin and Goose Green

The first major enemy ground position to be tackled was the garrison of Darwin and Goose Green, some 12 miles to the south of the beach-head. This task was given to the 2nd Battalion The Parachute Regiment (2 Para), who secured the jumping-off point at Camilla Creek from which to launch the attack. A half battery of 29 Commando Regiment RA were flown in to support them; not much, but all that

British troops, probably Welsh Guards, starting their 'yomp' from San Carlos to Port Stanley. The lead soldiers are members of a GMPG team, with the second man carrying the heavy tripod. They are still carrying their L1A1s and kit.



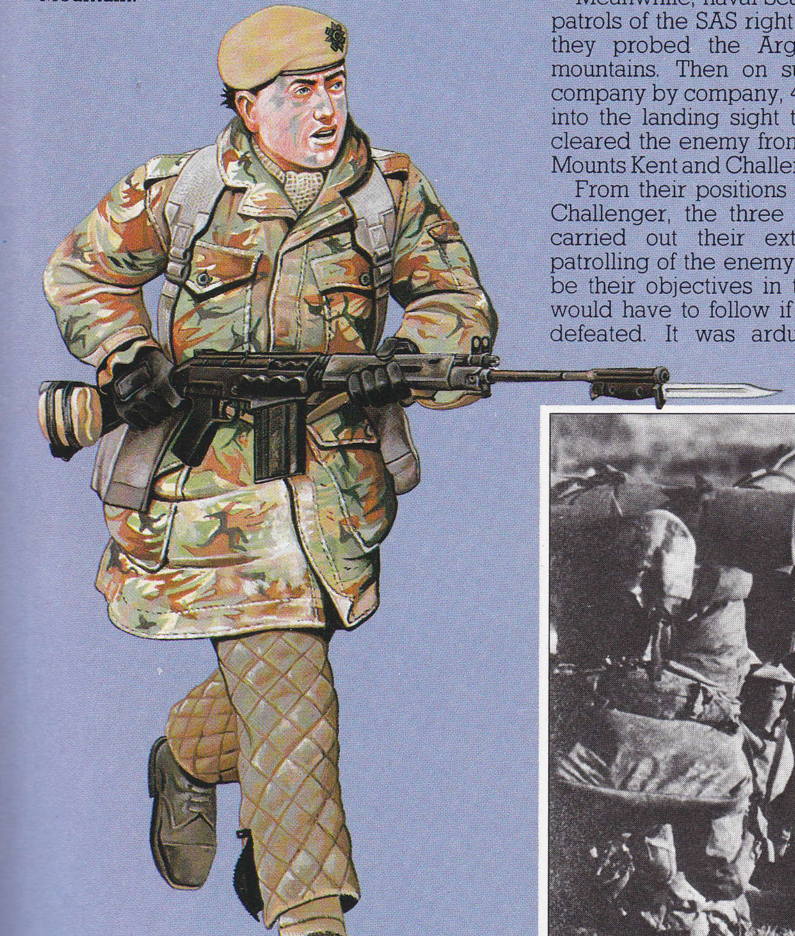
Royal Marines clearing houses in Grytviken, South Georgia. The Marine in the foreground is holding a L4A4 7.62-mm Bren gun, while the Marine at the rear is holding a GPMG with a short belt of 7.62-mm ammunition.

could be achieved in the time available. The CO decided to open with a night attack on the hills overlooking the settlements, supported by the half battery and naval gunfire.

The attack progressed satisfactorily to start with, but as daylight came on 28 May the full extent of the well-prepared defences, only approachable over entirely open ground, became apparent. With only very limited artillery support, and that from the air prevented by the weather, the achievement of the battalion's objectives was a hard slog. The death of the CO, Lieutenant-Colonel H. Jones, personally attacking enemy strongpoints, was an added spur to the 'Toms', who used infantry anti-tank weapons very effectively to silence well-established weapon positions. And so, by nightfall, and at a cost of 16 dead and over 30 injured, 2 Para was established on the dominating ground. The night had been spent in preparation for another day's fighting when, at first light, two captured Argentine NCOs were sent forward with an ultimatum. It was only when the reinforced garrison surrendered that the paras realized its size. As well as over 200 Argentinians dead on the battlefield, more than 1000 men came out of Goose Green to surrender.

Thus this fine battalion, inadequately supported, had by inspiring bravery and determination achieved that moral domination over the enemy which is, to any commander, the most invaluable of assets.

A Scots Guardsman, in non-standard quilted trousers, at the time of the fight for Tumbledown Mountain.



The booty of war. After the Argentinian surrender their weapons were thrown onto large open dumps such as this, which was one of many.

Closing with the enemy

While this battle was being fought, in order to close with the main enemy garrison around Port Stanley other units of the brigade had begun the 'Great Yomp'. The loss of *Atlantic Conveyor* on 25 May had cost the soldiers a large proportion of their transport helicopter lift (as well as many other important stores), so there was now no other way forward. While 45 Commando RM marched to Douglas settlement before moving on via Teal Inlet to Mount Kent, 3rd Battalion The Parachute Regiment (3 Para) moved directly to Teal and thence to Estancia Mountain.

Meanwhile, naval Sea King helicopters flew patrols of the SAS right forward by night, and they probed the Argentine forces in the mountains. Then on successive nights, and company by company, 42 Commando RM flew into the landing sight they had secured and cleared the enemy from the two main ridges, Mounts Kent and Challenger.

From their positions on Estancia, Kent and Challenger, the three forward infantry units carried out their extensive and detailed patrolling of the enemy positions that were to be their objectives in the main battle which would have to follow if the enemy was to be defeated. It was arduous, cold, dirty and dangerous work, but it paid off when the time came.

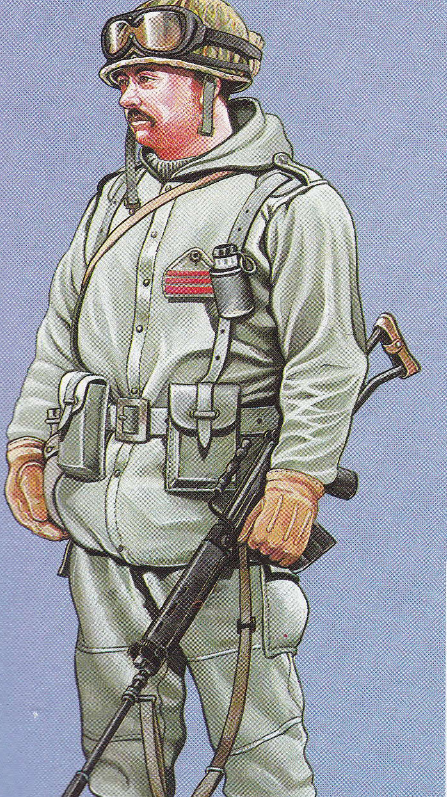
Soon after the fall of Goose Green, the 2nd Formation, 5th Infantry Brigade, arrived in San Carlos and was tasked with closing up to the enemy on the southern route. In a daring dash by helicopter and any other means of transport that could be found, 2 Para pushed forward to Bluff Cove, and it was on the final day of the follow-up to this move that two companies of 1st Battalion Welsh Guards were caught in the bombing of the logistic support ship *Sir Galahad* at Fitzroy.

The main battles

Thus by 10 June the British were firmly established in the mountains 10 miles to the west of Port Stanley, the enemy had been cleared from the rest of East Falkland and the final assault on the main Argentinian positions could go ahead. This was the classic infantry battle of the war, and was carried out in two phases.

British troops, probably paras, await a helicopter lift near Port Stanley. The soldier in the centre with the L1A1 has fitted a 30-round Bren gun magazine to his rifle. Note the bulk of the pack on the left.

Above: The other side of the Falklands campaign, as soldiers carry out their 'sentry-go' on a bleak and cold hillside with a 7.62-mm GPMG on an anti-aircraft mounting behind them. Most units had only GPMGs as their anti-aircraft defences.



Above: Wearing the standard padded parka of the Argentine forces, this Marine Warrant Officer carries a folding stocked FN FAL rifle.

In the first phase, making full use of the information gained over the previous nights and days by their observation posts and patrols, 3rd Commando Brigade RM carried out a co-ordinated three-battalion night attack. In the north, 3 Para, in a bitterly contested fight in which Sergeant McKay won the second VC of the war, carried Mount Longdon. To the south of them, 45 Commando RM drove the enemy from the particularly rocky and difficult twin summits of Two Sisters. And southward again, 42 Commando, in a brilliantly well-prepared and executed attack, moved right round the flank of Mount Harriet, driving the 300 or so defenders who were not killed or captured *in situ* into British lines to be made prisoners there.

Two nights later, back under command of 3rd Commando Brigade once more, 2 Para conducted a beautifully co-ordinated attack to carry Wireless Ridge, and to watch the sunrise in the heart of the Argentine rear area; while on the main ridge 5th Infantry Brigade's 2nd Battalion Scots Guards fought their way onto Mount Tumbledown, defeating one of the toughest of the Argentine battalions. This attack was supported by a feint by 1st Battalion Horse Guards – made up to strength after their lossses at Fitzroy by two companies of 40 Commando RM – on the southern flank by the main Stanley road, whence it was believed the Argentines expected the attack to come.

With daylight, 1st Battalion 78th KEO Gurkha Rifles were passing through the Scots Guards to take Mount William when the enemy crumbled and resistance ceased. That night the Argentine garrison surrendered.

Infantry battles – all arms victory

Thus it was the infantry closing with the enemy and wresting vital ground from him that brought Argentine occupation of the Falkland Islands in 1982 to an end. But, as the infantry themselves would be the first to recognise, their success was, as always, dependent upon the professionalism, the bravery and the skill of all other arms and Services. The infantry, its ammunition and its casualties were moved by helicopters of all Services, fire support from the Royal Artillery and the Royal Navy paved the way, and the Sappers, as always right up at the front, cleared a path through many minefields, but the infantry provided much of their own supporting fire too.

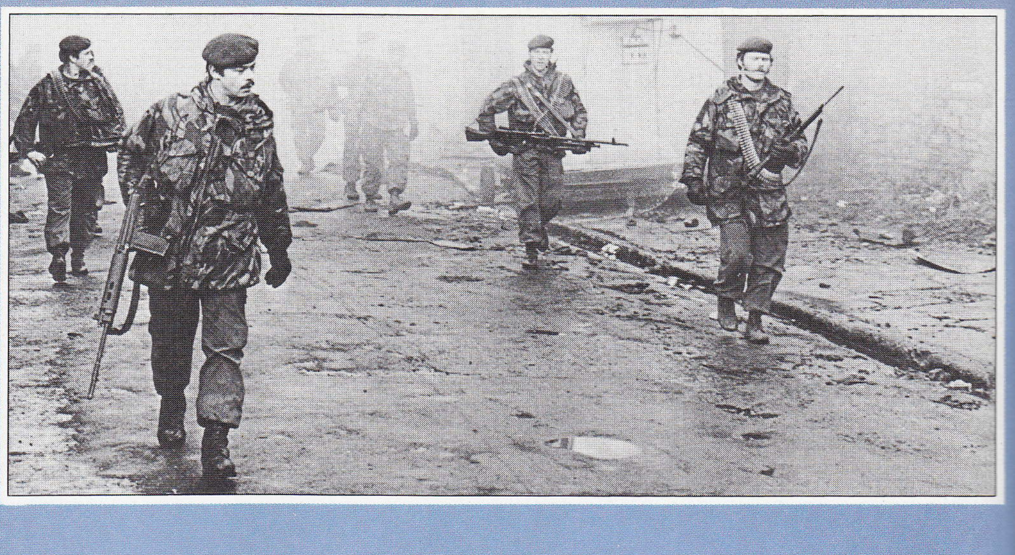
The 81-mm mortar, with its high trajectory, is particularly valuable in mountainous terrain where crest clearance can be a severe problem.

The 0.5-in Browning machine-guns brought by some battalions also proved their value over the long ranges required in the Falkland hills. Less obvious was the value of the infantry's own range of anti-tank weapons (66-mm LAW, 84-mm MAW Carl Gustav, and MILAN missiles) in knocking out well dug-in positions which were proving difficult to dislodge.

But the greatest advantage enjoyed by the British infantry was their professionalism. Much of the Argentinian equipment was as good as theirs, and some even better. Certainly the defenders had a more lavish scale of night-fighting aids, such as image-intensification viewing devices, available; yet it was at night that the main battles were fought and won.

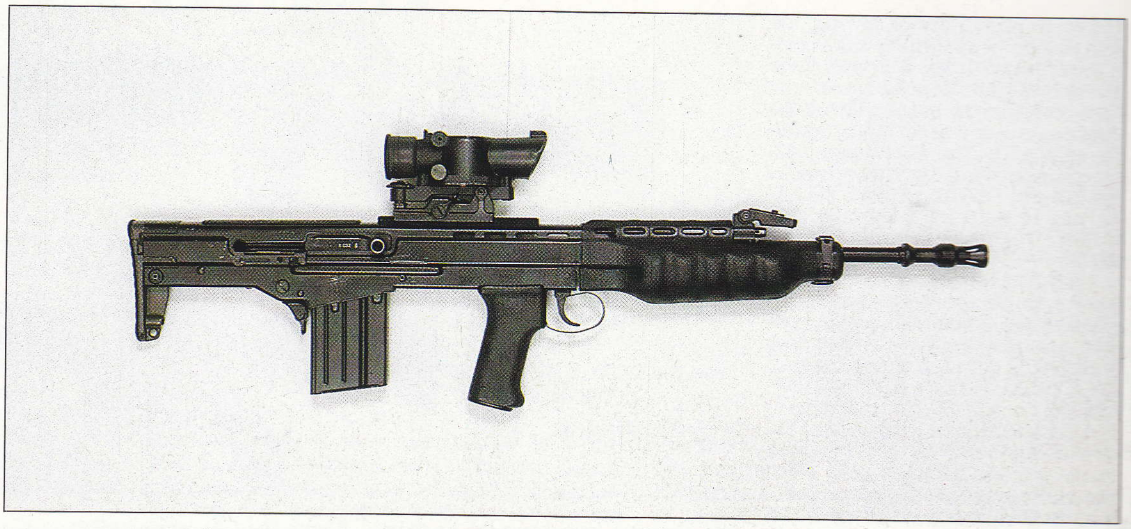
Night attacks, even at Company level and by experienced veterans, are regarded by professional soldiers as particularly difficult operations. At Brigade level, in an Antarctic winter, in mountains, conducted by a formation not one member of which had fought in a major war, it is an astonishing achievement. The battle for Stanley is a remarkable tribute to the sheer professionalism of British soldiers of all arms, and especially that of the infantry.

The end of it all, as paras enter the wreckage of Port Stanley. There are three GPMGs to be seen, and the soldier on the extreme right with the L1A1 is carrying a bandolier of 7.62-mm belted ammunition for the GPMG behind him.

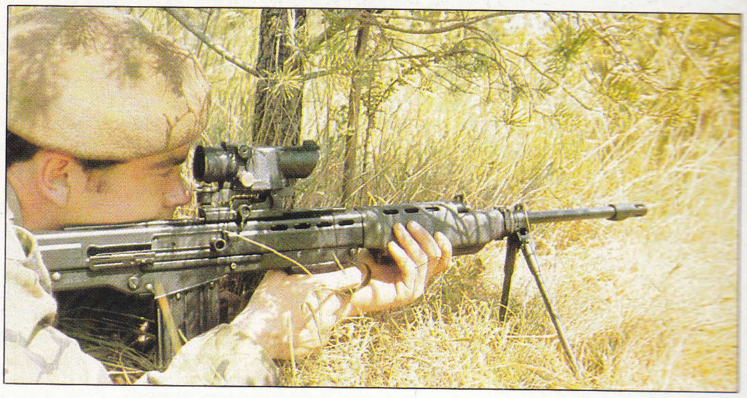


UK

5.56-mm Individual Weapon (IW) XL70E3



Above: This is the original 4.85-mm XL65E3 Individual Weapon, from which the present 5.56-mm XL70E3 has been developed. It differs from the current model in several ways, especially the shape of the forestock, and the magazine is now a slightly curved M16A1 item. Note the large optical sight, known as a SUSAT.



Right: The Light Support Weapon is the section support weapon version of the Individual Weapon. This model is the original version, the XL65E5, which has now been replaced by a 5.56-mm model: the XL73E2, with a revised forestock shape and other modifications.

The British army has been trying on and off to adopt a new small-calibre rifle cartridge since before 1914. For various reasons, both military and political, it has been unable to do so until comparatively recently. In the years after 1945 it did attempt to adopt a rifle known as the EM-2 which used a 7.11-mm (0.280-in) cartridge, but the adoption by NATO of the 7.62-mm×51 cartridge scotched that idea.

During the early 1970s another attempt to produce a new calibre was made. This time various researches indicated that a 4.85-mm projectile allied to the case of the American 5.56-mm round would be an ideal choice and a new weapon, the **Individual Weapon XL65E5**, was produced and demonstrated.

The Individual Weapon (IW) seemed to be an ideal rifle for the British army, but once again the British were foiled in their project. NATO decided that any new cartridge would have to be the standard round for all the NATO nations, and each nation had its 'pet' cartridge and weapon project. The result was one of the most exhaustive series of small-arms trials ever carried out over a series of years. Although the 4.85-mm round and the IW performed very well it soon became obvious that the extensive production facilities already set up to churn out the M193 5.56-mm round would be the final factor in the choice of 'winner'. The outcome was the selection of a Belgian round, the 5.56-mm SS109, and this marked the end of the 4.85-mm IW.

But all was not lost for the IW. Despite the choice of a new NATO standard round every nation involved decided to stick to its own choice of weapon design. The UK thus went ahead with the IW rechambered to take the new SS109 cartridge. The result is the **IW XL70E3**, now undergoing its final troop trials before production gets under way some time during 1984.

The IW is a compact weapon of the 'bull-pup' type. It is only one component of a new British Army small-arms family known as 'Small Arms 1980', or SA 80, the other component being the **Light Support Weapon XL73E2.** This latter weapon is almost identical to the IW but has a heavier barrel and a bipod to act as a section support weapon. The IW itself has undergone some external changes in appearance since the time of the 4.85-mm IW, but these alterations have been made purely for production reasons. Basically the IW is still an 'in-line' bull-pup design with a prominent optical sight over the body and a receiver and stock constructed from steel pressings. The forestock is tough nylon, and the muzzle has provision for a small bayonet and a built-in rifle grenade launcher. To simplify logistics to some extent the magazine now used is the same as that used on the American 5.56-mm M16A1. Night sights can be fitted if required.

When it enters service the IW will be a compact and easy-to-use weapon for it handles well and is easy to aim and fire: there is no firing recoil to mention and the optical sight makes aiming very simple. One thing that will cause problems for the British army is that a new form of rifle drill will have to be developed!

Specification

XL70E3

Calibre: 5.56 mm (0.22 in)

Length: 770 mm (30.31 in)

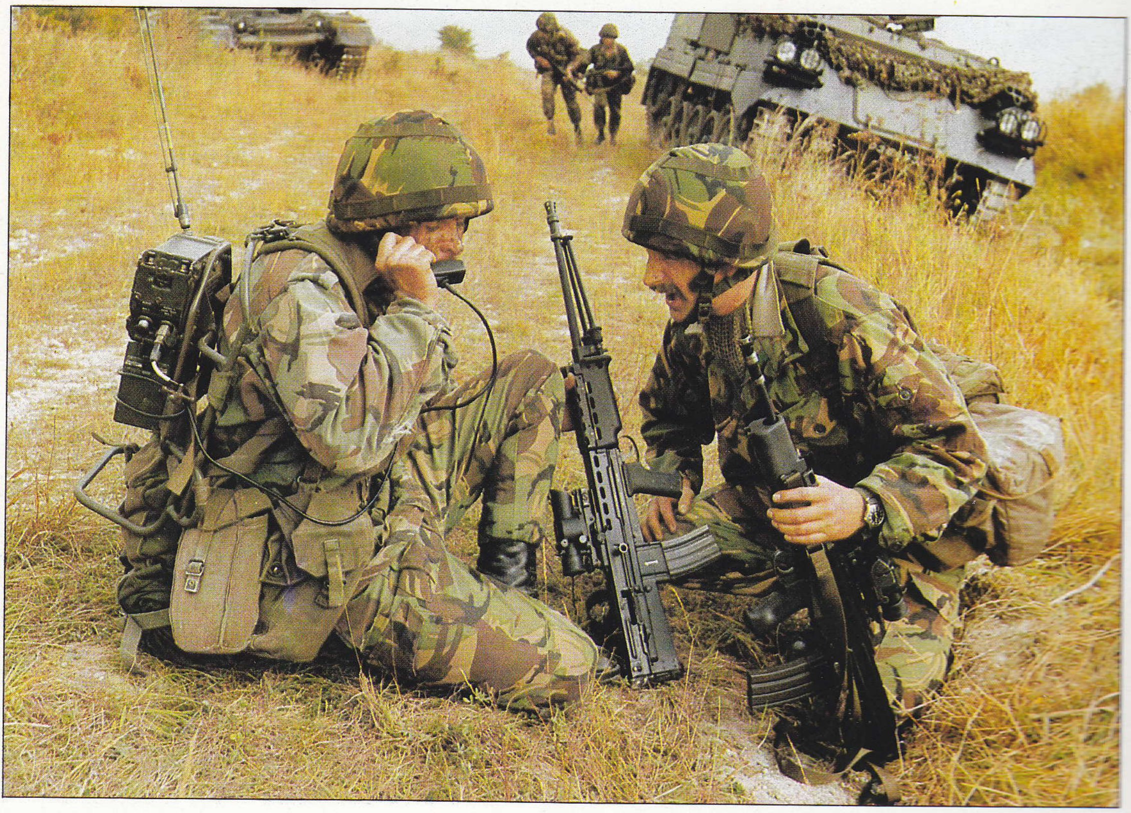
Length of barrel: 518 mm (20.39 in)

Weight loaded: 4.6 kg (10.14 lb)

Magazine: 30-round box

Rate of fire, cyclic: 700-850 rpm

Muzzle velocity: 900 m (2,955 ft) per second



The soldier on the right is holding the latest form of the 5.56-mm XL70E3 Individual Weapon (IW), while the other holds the 5.56-mm Light Support Weapon (LSW) XL73E2. Many components of the two weapons are interchangeable and both should soon be in British Army service.

USA

M16 and M16A1

Unlike so many rifles of its type, the rifle that is now the **M16A1** was a commercial design. It was a product of the prolific designer Eugene Stoner and first emerged as a product of the Armalite concern as its **AR-10** during the mid-1950s. The AR-10 used 7.62-mm ammunition, and with the advent of the 5.56-mm Fireball cartridge the AR-10 was redesigned to suit the new calibre. The result was the **Armalite AR-15.**

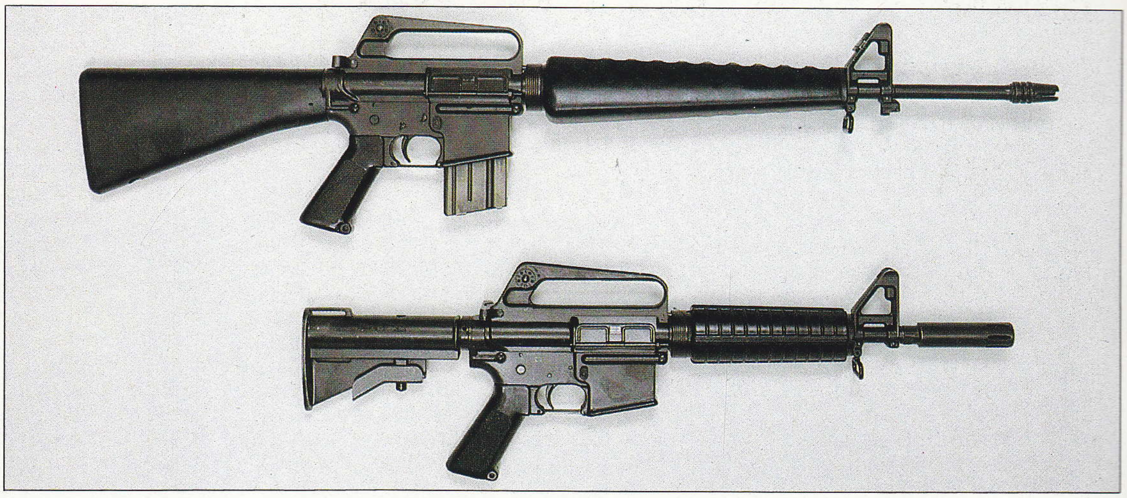
The AR-15 was submitted for a competition to decide the new standard rifle for the US armed forces. But before the competition was decided, commercial sales had already started: the British army took a batch of 10,000, making it one of the first customers to purchase significant quantities of the new design, and the US Air Force made another purchase soon afterwards. That was in 1961, and soon after this the AR-15 was selected by the US Army to become its new standard rifle as the **M16.** Production was then switched to the Colt Firearms Company, which took out a production and sales contract with Armalite. Since then Colt has kept its production contract, but somehow the name 'Armalite' still clings to the rifle that is now the M16A1.

The M16 became the M16A1 in 1966 with the addition of a bolt closure device fitted as the result of experiences in Vietnam. Since then the M16A1 can perhaps be regarded as the AK-47 of the Western world, for it has been produced in hundreds of thousands and has been widely issued and sold to nations all around the world. Numerous developments have been produced and tried, ranging from the usual light machine-gun variant with a heavy barrel and a bipod, down to short-barrel versions for special forces; there has even been a sub-machine gun variant. For all these changes the current M16A1 looks much like the first AR-15. Over the years there have been some changes as the rifling has been modified and more use is now made of internal chroming to aid cleaning. A recent introduction has been the **M16A2** which has a heavier barrel that can be used with the new NATO 5.56-mm SS109 cartridge, demanding yet another change in rifling.

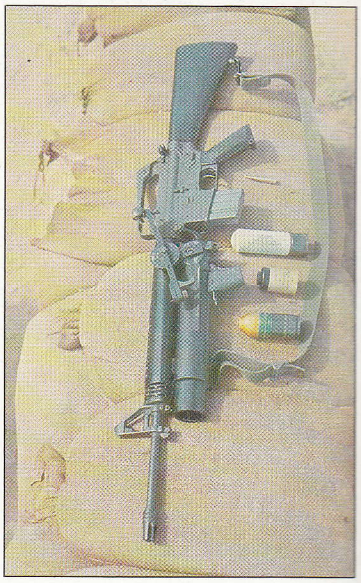
The M16A1 is a gas-operated weapon that uses the almost universally adopted locking system of the rotary bolt. A carrying handle over the receiver also acts as the rear-sight base, and nylonite is used for all the furniture. Although lending itself to mass production the M16A1 does not have the tinny appearance of many of its contemporaries, and has all the feel and finish of a high-quality weapon. In service it has become the carrier for a number of accessories which range from a blank adaptor to a special 40-mm grenade launcher mounted under the forestock (the M203).

The M16A1 and its variants seem set to remain in production for many years to come. Already licence production is under way in South Korea, the Philippines and Singapore, and more nations may well adopt the type in addition to the 12 or more who have already done so. The M16A1 is also widely used as a police weapon and the type can even be purchased commercially in many countries. It is already a favoured guerrilla weapon.

Despite the universal adoption of the L1A1 and the forthcoming IW, the British army still uses its examples in Belize and elsewhere, usually for issue to the Special Forces.



Above: Top: the original M16, recognized by the absence of the bolt-assist plunger of the M16A1 which is located above the trigger group. Below: the Colt Commando, a carbine version of the M16 and used in trials in Vietnam, where it was not a great success.



Right: M16A1 fitted with a 40-mm M203 grenade launcher under the barrel. This launcher can propel small spin-stabilized grenades to a range of about 350 m. Some of these grenades can be seen alongside the launcher and can be produced in a wide range of offensive loads, including HE and CS.

Specification

M16A1
Calibre: 5.56 mm (0.22 in)
Length: 990 mm (38.98 in)
Length of barrel: 508 mm (20.00 in)
Weight loaded: 3.64 kg (8.02 lb)
Magazine: 30-round box
Rate of fire, cyclic: 700-950 rpm
Muzzle velocity: 1000 m (3,280 ft) per second

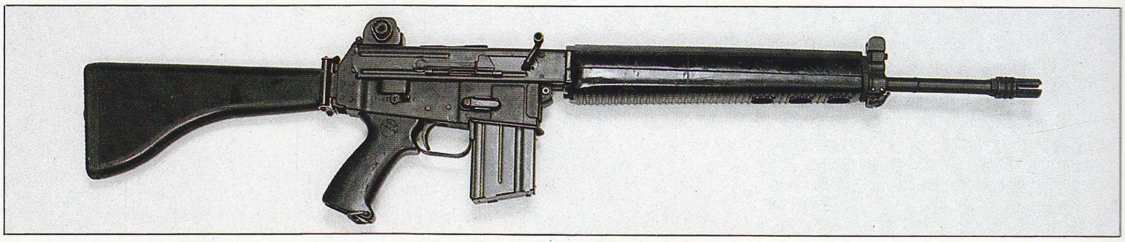
USA

Armalite AR-18

Once the Armalite concern had cleared its design desks of the AR-15 with production under way by Colt Firearms of the M16/M16A1 series, it decided to look to the future for new products. With the 5.56-mm round well established, Armalite decided that what was needed was a simple weapon that could fire the cartridge. While the AR-15 was a sound weapon it was not easy to produce without sophisticated machine tools, and throughout much of the world these machine tools were not available. Thus the need for a weapon which could be simply produced by Third World nations was recognized, and a drastic revision of the AR-15 design was undertaken.

The result was the **AR-18**, which is very basically an AR-15 adapted for manufacture by the now-familiar production expedients of pressed steel, plastics and castings. For all these expedients the AR-18 is a sound design that is easy to produce, maintain and use. In general appearance and layout it is similar to the AR-15 but the stamped steel receiver gives it a bulkier outline. The plastic butt is designed to fold alongside the receiver for stowage or firing from the hip.

Once the AR-18 design was complete Armalite attempted to find purchasers, but with the AK-47 and the M16A1 flooding the world markets there were few takers. An arrangement to produce the AR-18 in Japan fell through and for some years the design was in abeyance. Then the Sterling Armaments Company of the United Kingdom took out a licence, undertaking some production and at one time moving production to Singapore. Some sales were then made locally but what was more important was that the local defence industry took the design as the basis for its own weapon designs, the AR-18 now living on disguised in many forms and under various labels.



This AR-18 was originally manufactured in Japan but was captured from the IRA in Belfast. It is the standard production model with a butt that can be folded along the right-hand side of the receiver. The cocking handle can be seen poking upwards above the magazine.

Specification

Calibre: 5.56 mm (0.22 in)
Length: 940 mm (37.00 in) with stock extended or 737 mm (29.00 in) with stock folded
Weight loaded: 3.48 kg (7.67 lb) with 20-round magazine
Magazine: 20-, 30- and 40-round box
Rate of fire, cyclic: 800 rpm
Muzzle velocity: 1000 m (3,280 ft) per second

The M16 in Action

The M16 was first produced to an Armalite design in the late 1950s. Light, and firing a lightweight high velocity bullet, it was handy and effective at most combat ranges. Since that time it has become the standard US Army rifle and has sold in millions throughout the world. Not without problems in early operational use, the M16 has proved itself in action time and time again.

During the late 1950s the standard US Army service rifle was the M14, a bulky and heavy (5.1 kg/11.24 lb loaded) weapon that fired the 7.62-mm×51 cartridge. It was a sound enough weapon that used the basic operating mechanism of the Garand M1 rifle of World War II. While this rifle was perfectly adequate for service in Europe and many other places, it was not the preferred weapon for the close confines of jungle fighting and it was with jungle fighting that the Americans were beginning to find themselves involved.

When the French and British withdrew from the Far East it left a power void that many local political activists were anxious to fill. China and the Soviet Union were only too happy to assist their endeavours and the United States decided that it was in the national interest to take a hand in the affairs of the region. Usually this meant some form or another of economic aid or guidance, but in the wake of these early programmes came the need for military aid as well. Many of the small nations in the Far East were still using weapons left over from World War II, and the Americans usually offered to replace the relics in use with modern weaponry. In the rifle department they were not too well placed to meet the requirements. The peoples of the Far East are usually of slight stature and rifles such as the M14 were too large for them to handle with comfort. Even the older M1 was really too bulky a load so the Americans cast about for a suitable new rifle.

They soon found the weapon required in the Armalite AR-15, a thoroughly modern weapon that was light, not too large and had virtually no recoil when fired. A large quantity was procured and handed out to various nations, American military advisers carrying out the necessary training. It was during this period that the advisers, who were highly-qualified weapon technicians quite apart from their advisory capacity, noted the attributes of the AR-15 and wondered why they were handing out to all and sundry a rifle that was in many ways better than their own service equivalent. Their views soon reached the ears of the higher US Army echelons, who set about running their own trials.

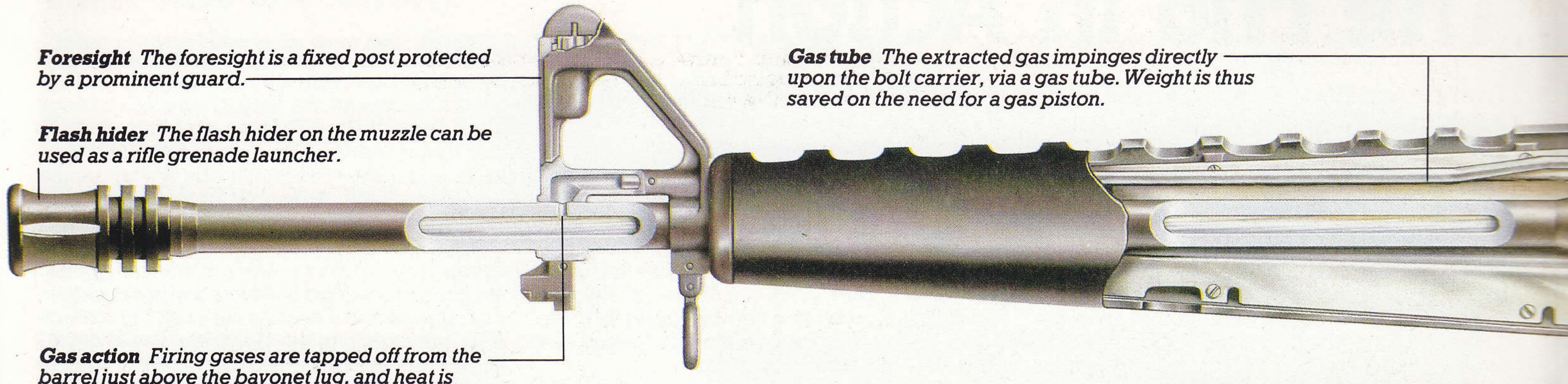
That was in 1958. The recommendation at the time was that the AR-15 should replace the M14, but that meant a drastic change-over in ammunition supply and, as time was to show, it was the ammunition change-over that was to be crucial. But the US Army was pushed into action when in 1961 the US Air Force procured a batch of AR-15s under the designation M16. Later the same year the US Army also purchased a batch and the M16 gradually started to filter through the US Army supply system. At first issues were made only to Special Forces units, and it was these units which were mainly involved in the American activities in South East Asia.

For the Americans, East Asia became increasingly to mean the protracted internal struggles of Vietnam. More and more American troops were sent to the area until a sizeable proportion of the US Army was involved. These troops were usually given a priority issue of the M16 and it was not long before large-scale actions involving American forces were taking place. Soon the first intimations that the M16 rifle was not behaving as it should filtered through the US Army network.

All manner of alarming stories were then told of the M16 breaking down in action. Analysis of these reports gradually showed that the M16s were jamming solid as a result of excessive fouling. These reports grew in volume and regularity to the extent that a special investigation board was established by the US Army, and the House of Congress set up its own special investigatory board. This latter board went into its task with great application and it was this board's final report that set out the whole sorry tale.

Airborne cavalry of the US Army leap from a Bell UH-1D 'Huey' in Vietnam in one of many anti-Viet Cong sweeps. The troops have their M16s at the ready. It was under such conditions that the early M16s began to show signs of trouble due to the 'no need to clean' claim.

The M16 in Action



Foresight *The foresight is a fixed post protected by a prominent guard.*

Flash hider *The flash hider on the muzzle can be used as a rifle grenade launcher.*

Gas tube *The extracted gas impinges directly upon the bolt carrier, via a gas tube. Weight is thus saved on the need for a gas piston.*

Gas action *Firing gases are tapped off from the barrel just above the bayonet lug, and heat is vented through holes above the forestock. It was at the gas port that the Vietnam fouling troubles started and then spread through the gas system to the bolt.*

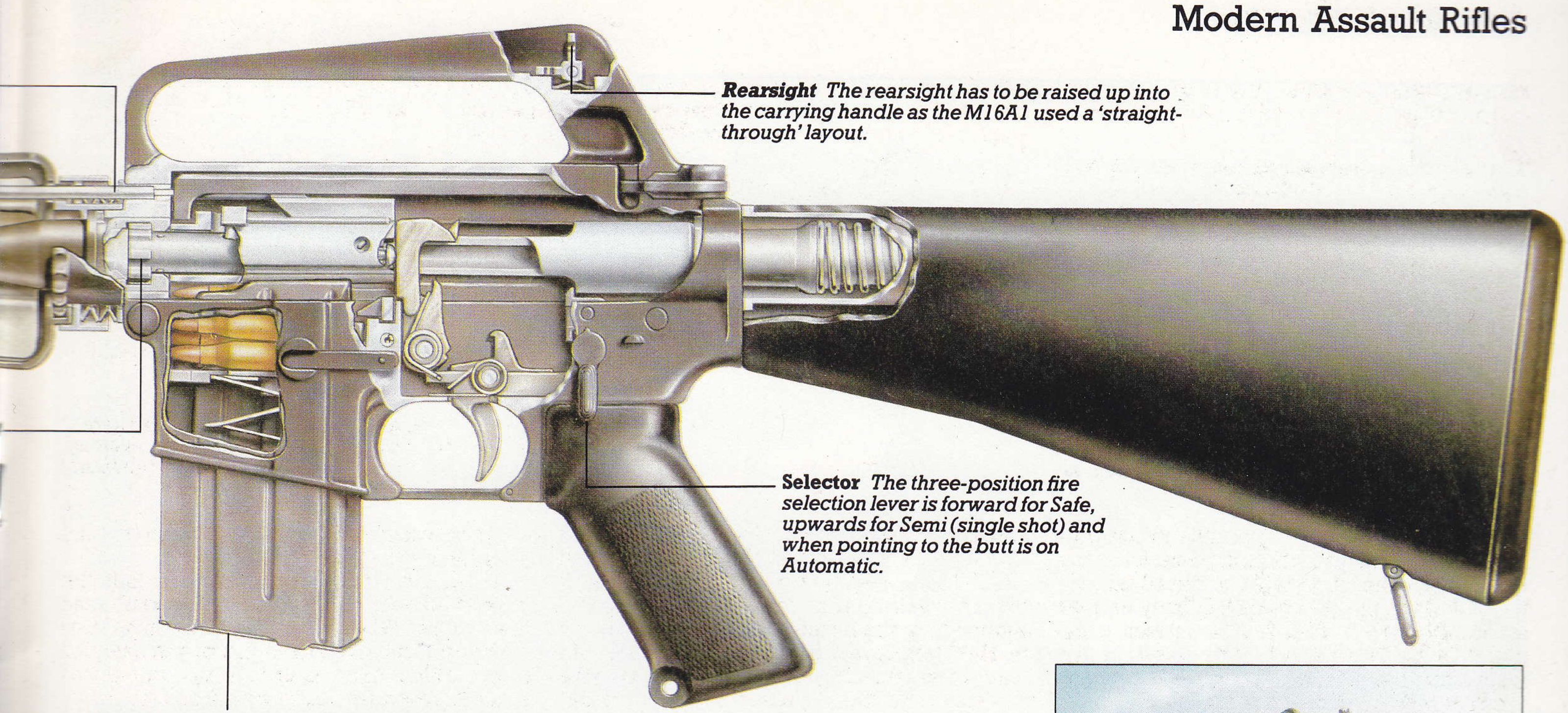
Hammer *The M16A1 uses a rotary lug bolt action which operates along cams in the receiver wall. If this is not cleaned the bolt will seize.*

It now seems almost impossible to comprehend how a nation as rich and powerful as the USA could make the kind of blunders that led to the M16 débacle. When the US Army carried out its initial tests on the rifle all went well, to the extent that when the rifle was issued to the troops it was handed out with the message that the rifle was so efficient that it would never require cleaning. Exactly where this odd message originated is now impossible to determine, but needless to say the troops were happy to accept such statements and they never did clean their rifles. This was one of the major factors that led to the numerous breakdowns that started to occur, but there was another reason also.

This unsuspected factor was that the ammunition specification had been changed without anyone being told. When the initial AR-15 trials were being carried out commercial ammunition was used. This commercial ammunition was based on a propellant known as IMR (improved military rifle), which had been in use for many years. When fired in the 5.56-mm cartridge it presented no problems, burning cleanly and reliably. Most of the early trials ammunition and early batches of service ammunition used this type of propellant which tended to hide the problems that were to come in later batches based on an entirely different propellant. This new propellant was known as ball powder, and was introduced for general service use during 1954. Later it was introduced for filling the cases of 5.56-mm ammunition and when these reached the troops the troubles began.

It has already been mentioned that the troops had been told they did not need to clean their M16s. When this lack of cleaning was combined with the residue left by the new ball powder-filled cartridges a sticky residue was formed. When hot this residue formed a sticky paste, but once cooled the carbon elements in the residue became solid and jammed the M16 mechanism, especially the bolt head. For the

M16-armed troops disembark from a Bell UH-1D in Vietnam. The helicopter is armed with a 7.62-mm Minigun, a rifle-calibre version of the Gatling, which is here partly hidden under a canvas cover for weather protection.



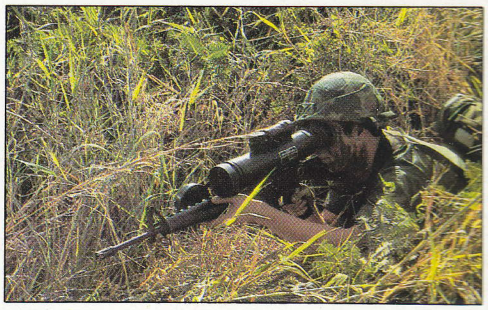
Rearsight *The rearsight has to be raised up into the carrying handle as the M16A1 used a 'straight-through' layout.*

Selector *The three-position fire selection lever is forward for Safe, upwards for Semi (single shot) and when pointing to the butt is on Automatic.*

Magazine *20- or 30-round magazines may be used and metal and nylonite types are in use.*

Below: Near Duc Pho City, Vietnam, June 1967. American soldiers patrol to find North Vietnamese units and both are carrying M16s. The soldier in the foreground has 7.62-mm ammunition belts for the section M60.

On the ranges with an M16A1. This photograph clearly shows the early type of flash hider, which has now been replaced by a revised design with a cruciform notch along the centre to improve its performance.



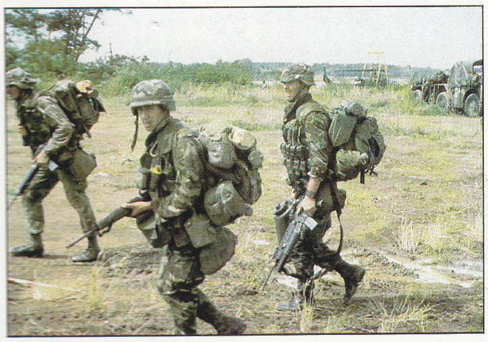
This M16A1 is fitted with an AN/PVS-2 Starlight night-sighting telescope, which uses an internal image intensifier to amplify available light so that the user can aim at targets in what appears to be complete darkness to the naked eye.

A M203 40-mm grenade launcher is fitted onto the forestock of a M16A1. The M203 uses its own sleeve to clip over the forestock, and once in place the launcher uses its own trigger system separate from that of the M16A1.

A vision of the future as US Army troops leave a M2 Bradley ICV. They are carrying the M16A1 and are wearing the new pattern helmet, which is made of Kevlar resin and nylon-based material in place of steel.

soldier in the field there was no way of clearing this problem for the M16 has no bolt handle, only a cocking piece. The only way the guns could be unjammed was by shoving a cleaning rod or something similar down the bore of the barrel. Stories of soldiers leaping around firing parapets and jamming cleaning rods down the barrels of their comrades' rifles became legion and many casualties resulted from this undesirable practice. It was also noted that quite apart from the jamming, components were breaking long before they should.

By this time, the mid-1960s, the US government had taken the whole affair out of the hands of the military, which continued its own investigations and set up its own enquiry board. Many of the civilians involved were ex-military men who were horrified at what they discovered. They were shown M16 rifles that were covered in dirt and rust and they were shown examples of M16s clogged solid with fouling. It was not long before the ammunition change was discovered. What had happened was quite simply that the demands of an ever-growing Vietnam involvement had outstripped the abilities of the American ammunition suppliers to keep filling the 5.56-mm cartridges with the satisfctory IMR propellant. Ball powder had been substituted, but somewhere along the line the information had been 'lost'. Full trials had not been carried out on the effects of the new ball powder and the troops in the field had to discover the hard way that not only did the ball powder burn leaving carbon and other deposits, but also that it burned at a rate which increased the rate of fire of the M16 beyond a safe limit; hence the breakages.



The new US Army Kevlar helmet was in operational service for the first time in Grenada during October 1983. The troops are from the 82nd Airborne Division and are carrying M16A1s, the one on the right fitted with a M203 launcher.

Under normal circumstances the fouling would have been serious enough. When combined with the lack of cleaning it was a disaster. Immediately the facts became clear a crash training programme was introduced and cleaning kits and lubricants were issued. Troops started to clean their M16s and things immediately improved. Changes were introduced on the M16 production lines; one was the introduction of a revised buffer arrangement inside the receiver to slow down the rate of fire using the ball powder propellant. Another change was the introduction of a thumb-operated bolt closure device on the right-hand side of the weapon above the trigger group. If a round did jam or the bolt seized, the soldier could at least force the offending round into the chamber to free things by firing. These changes altered the designation from M16 to M16A1.

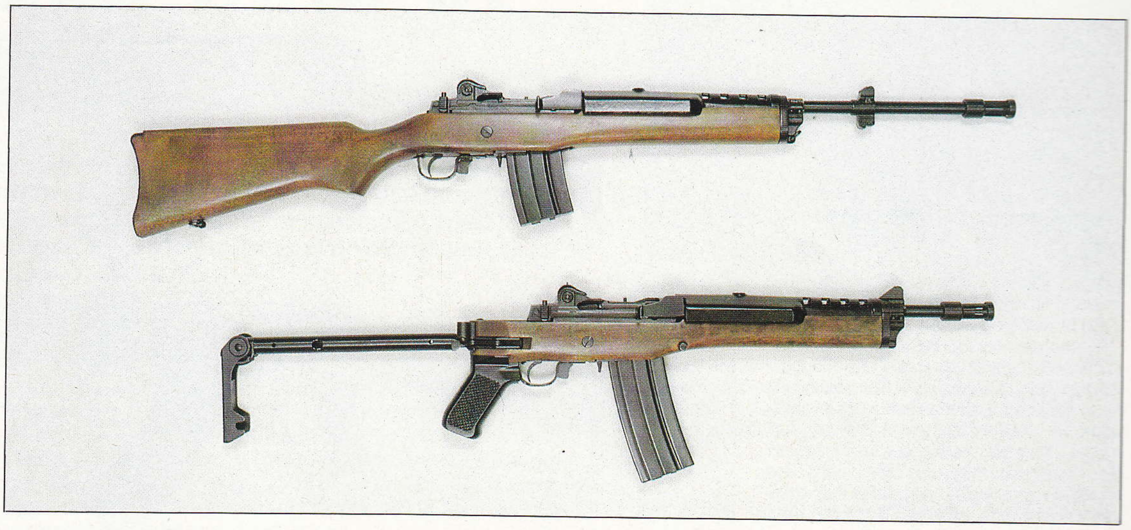
Another outcome of the Congress report was an investigation into the methods of weapon and propellant procurement by the US Army, which no doubt caused a few upsets. But the immediate outcome was that the M16A1 became a perfectly satisfactory service rifle and the fouling days were over. This has now led to yet another problem, for the daily cleaning and lubrication of the M16 now means that the M16 jams when used in dust and sand conditions such as those encountered in the Middle East. The formation of the Rapid Deployment Force (RDF) has meant extensive exercises in the Egyptian deserts and elsewhere in the region. It now looks as though another course of remedial action will have to be taken.

Despite these difficulties the M16A1 has turned out to be an excellent service rifle. The one reservation of many military observers is the ammunition; in general terms it lacks power. In many cases the bullet is so small that if it strikes a target the impact is so slight that the effect is far less than that of an equivalent bullet of larger calibre. However, if the bullet 'tumbles', as it sometimes will, the shock effect from the resultant large wound is severe. To some extent these ammunition drawbacks have now been largely overcome by the introduction of the new SS109 round.

But to return to the original reason for issuing the M16, or the AR-15 as it then was: the peoples of the Far East and South East Asia have taken to the weapon with alacrity. It is now the standard weapon for many armed forces in the region and some nations even produce their own for re-sale throughout the region.

USA

Ruger Mini-14



Top: The attractive lines of the Ruger Mini-14 seen fitted with a 10-round box magazine. The bottom weapon is the Ruger AC-556F, which is intended for service as a purely military assault carbine. It has a folding metal butt and is seen here fitted with a 30-round box magazine.

When it was first produced in 1973, the **Ruger Mini-14** marked a significant turn away from the mass production methods introduced during World War II towards the fine finish and attention to detail that was formerly the hallmark of the gunsmith's art. The Mini-14 is an unashamed example of how guns used to be made before the steel stamping and the die-cast alloy came upon the scene.

From a design viewpoint the Ruger Mini-14 is a 5.56-mm version of the 7.62-mm (0.30-in) Garand M1 service rifle of World War II. By adopting the Garand action Ruger has managed to combine a sound and well-engineered design with the ammunition of a new technology. When this is allied to craftsmanship and a deliberate appeal to those who look for that something extra in a weapon the result is a remarkable little rifle.

In appearance the Mini-14 has the characteristics of a previous age. The materials used are all high quality and in an age where plastics have now taken over the furniture is all manufactured from high-grade walnut. But visual appeal has not been allowed to take precedence over functional safety, for the Mini-14 has been carefully engineered to prevent dust and debris entering the action. But some degree of eye appeal has been allowed to affect the finish, for the weapon has been carefully blued all over, and there is even a stainless steel version that sells very well in the Middle East.

The Mini-14 has not yet been adopted by any major armed forces but it has been sold to such establishments as police forces, personal bodyguard units and to many special forces who prefer a well-engineered and balanced weapon to the usual 'tinny' modern products. To suit the requirements of some armed forces Ruger has now developed a special version that should appeal to many soldiers. This is the **Mini-14/20GB.** Police forces have been catered for by the introduction of the **Ruger AC-556** with glassfibre furniture, and another innovation is the **AC-556F** with a folding stock and a shorter barrel. The two AC-556 designs can be used to fire on full automatic for bursts, whereas the normal Mini-14 is a single-shot weapon only.

Specification

Mini-14

Calibre: 5.56 mm (0.22 in)

Length: 946 mm (37.24 in)

Length of barrel: 470 mm (18.50 in)

Weight loaded: 3.1 kg (6.83 lb) with 20-round magazine

Magazine: 10-, 20- or 30-round box

Rate of fire, cyclic: 40 rpm

Muzzle velocity: 1005 m (3,300 ft) per second

CZECHOSLOVAKIA

Vz.58

At first sight the Czech **vz.58** assault rifle looks very like the Soviet AK-47, but this resemblance is deceptive for the two designs are different mechanically. The vz.58 is a gas-operated weapon but the unlocking mechanism uses a pivoted locking piece in place of the rotating bolt of the AK-47 family. The trigger mechanism is also different and employs flat springs rather than coil springs. The overall result is an entirely different mechanism. Exactly why the Czechs felt it necessary to produce their own design in view of the availability of the AK-47 adopted by all other Warsaw Pact nations is uncertain, but one fact that has resulted from this 'go it alone' stance has been that the vz.58 has been sold on the open arms market with a facility that would not have been possible with the AK-47.

The vz.58 is very well made, with the receiver machined from solid metal. Early versions used a wooden butt, with plastic for such items as the pistol grip and the forestock. More recent versions have used a form of plastic into which wooden chips and shavings have been compressed resulting in a characteristic appearance. Three basic models have been produced, one with a conventional butt, one with a folding butt and a version with the receiver fitted to take a variety of night sights. The last version may also be fitted with a light bipod and a prominent flash hider over the muzzle.

The facility with which the Czechs can market the vz.58 is such that the type can be purchased commercially 'over the counter' in many countries, but has still been used by armed forces as disparate as the Viet Cong and the IRA. One great attraction of the vz.58 is the price. Although this varies according to the quantity involved it is still relatively low compared with many other weapons. The Czechs are very willing to supply the 7.62 mm×39 ammunition as well, again at a very attractive price.

Specification

Calibre: 7.62 mm (0.3 in)

Length: 820 mm (32.28 in)

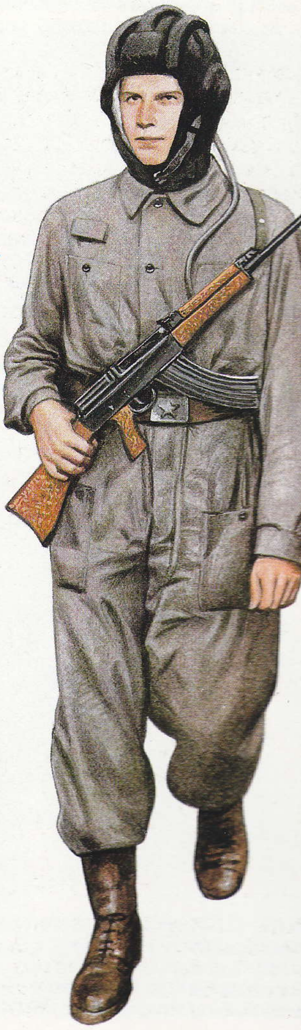
Length of barrel: 401 mm (15.79 in)

Weight loaded: 3.28 kg (8.42 lb)

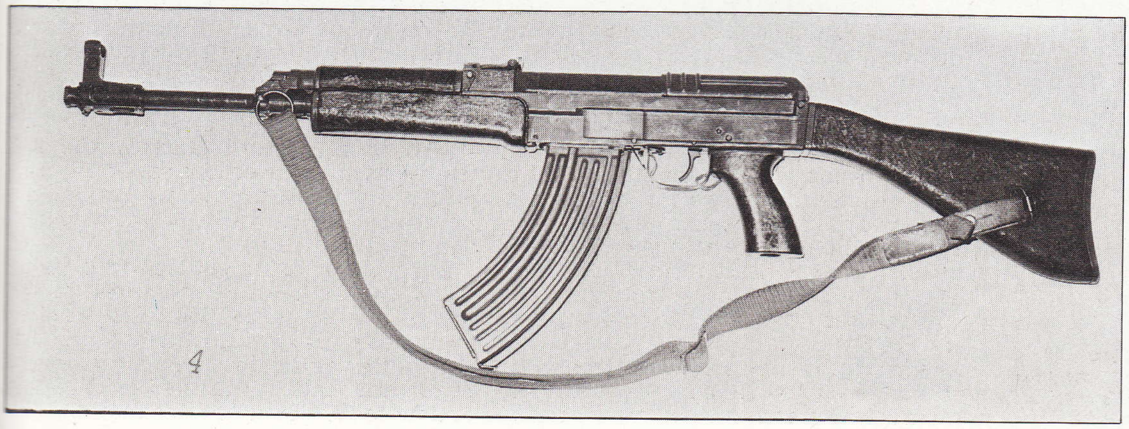
Magazine: 30-round box

Rate of fire, cyclic: 800 rpm

Muzzle velocity: 710 m (2,330 ft) per second

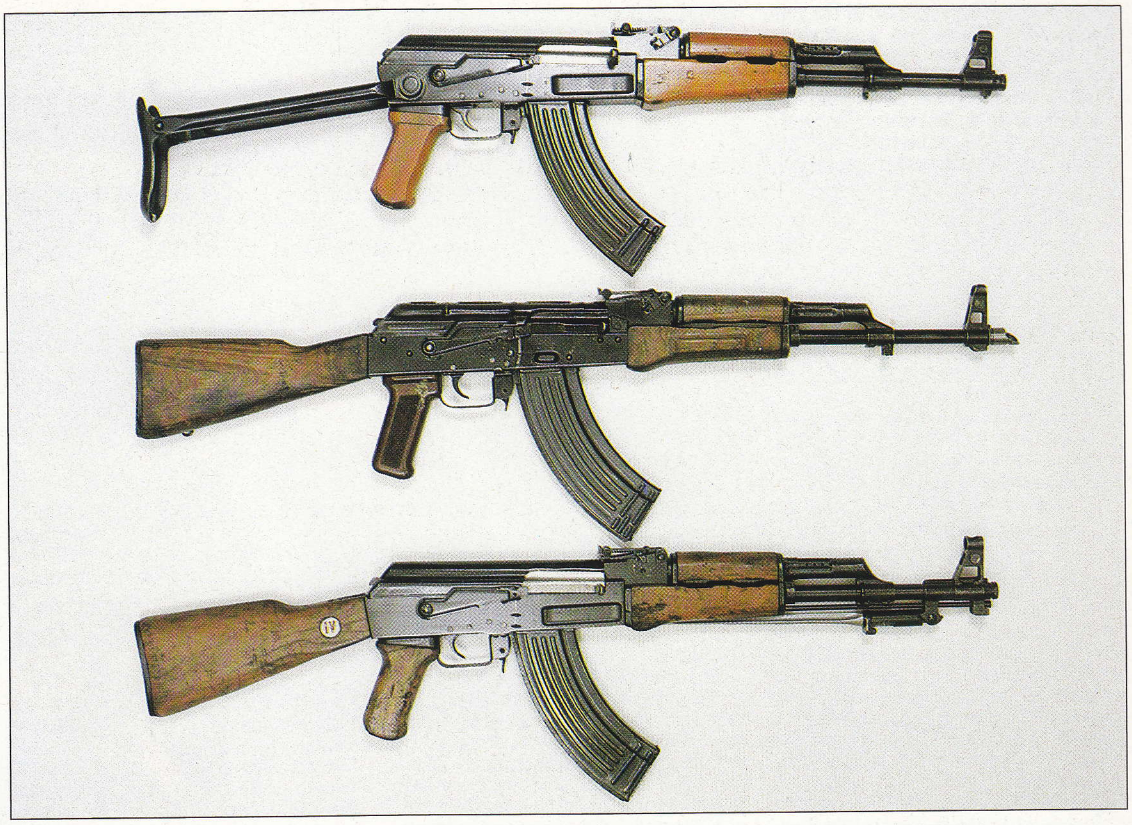


Seen here carried by a young Czech tank crewman, the Vz.58, also shown below, differs internally from the otherwise ubiquitous Kalashnikov. Also different is the compressed plastic/woodchip mixture which forms the butt and foregrip.



USSR

AK-47 and AKM



Top: AK-47 with folding metal butt; centre: AKM identifiable by muzzle brake attachment and hand-grip on forestock, and bottom: Chinese Type 56 from Zimbabwe, the Chinese version of the AK-47 with its own integral bayonet seen folded under the forestock.

The **AK-47** must be rated as one of the most successful and widely-used of any type of small arm ever produced. Both it and its successor, the **AKM**, are now used all over the world by forces regular and irregular, and both types are still in production in one form or another in many countries.

The first AK-47 was designed around a short 7.62-mm calibre cartridge that owed much to the introduction of the German 7.92-mm *kurz* round. The Red Army was often on the receiving end of the German assault rifle family (the MP 43, MP 44 and StuG 44) and asked for their own counter. The result was the 7.62-mm×39 cartridge and the AK-47. The designer was Mikhail Kalashnikov and his design is often referred to by his surname. The first examples were issued for service during 1946 and the weapon gradually became the standard weapon of the Warsaw Pact forces. The production lines were huge and the numbers that rolled off them were vast, but such was the demand that most Warsaw Pact nations set up their own production facilities. From this sprang the large numbers of AK-47 sub-variants that continue to delight the gun research buff to this day.

The basic AK-47 is a sound and well-made weapon that carried over few of the mass production expedients employed by its German wartime equivalents. The AK-47 receiver is machined and good-quality steel is used throughout with wooden furniture as standard; the result is a weapon that can absorb any amount of hard use and mishandling. As there are few moving parts and stripping is very simple, maintenance is also simple and can be accomplished with even a minimum of training.

Before long different production versions of the basic AK-47 emerged, even within the Soviet Union, and a version with a folding steel butt was produced. All these different versions used the same mechanism, a simple rotary bolt that was cammed into corresponding grooves in the receiver by bolt cams. Operation is by gas tapped from the barrel via a gas port.

AK-47s were produced in China, Poland and East Germany and the basic design was copied by several designers abroad, including those of the Finnish **Valmet M60** and **M62.**

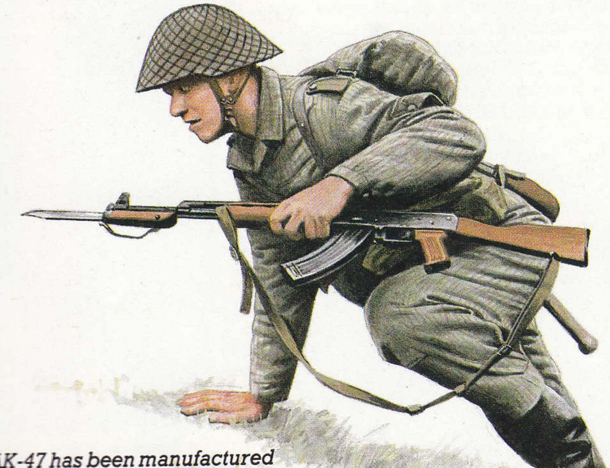
For all its huge success and acceptance, it was finally admitted during the late 1950s that production of the AK-47 was too involved in manufacturing facilities. A redesign produced the AKM, which outwardly resembles the earlier design but is generally revised to facilitate production. The most obvious external change is to the receiver, which is formed from a steel stamping in place of the former machined equivalent, but internally the locking system has been revised to make it more simple. There are numerous other differences but the overall changes are in manufacturing methods.

The AKM did not immediately take the place of the AK-47 but acted more as a supplement to numbers. The other Warsaw Pact production lines gradually switched to the AKM, some nations (such as Hungary) even going so far as to modify the basic design to produce their own version, which often differs in many ways from the original (the Hungarian **AKM-63** even looks different but retains the basic mechanism of the AKM). A version with a folding steel butt is known as the **AKMS.**

The AKM is still being produced, and the AK-47 and AKM will remain in service until well into the next century, if not beyond. This longevity must be partially attributed to widespread availability and the numbers produced but the basic fact is that the AK-47 and AKM are both sound and tough weapons that are easy to use and simple to maintain.

Specification
AK-47
Calibre: 7.62 mm (0.3 in)
Length: 869 mm (34.21 in)
Length of barrel: 414 mm (16.30 in)
Weight loaded: 5.13 kg (11.31 lb)
Magazine: 30-round box
Rate of fire, cyclic: 600 rpm
Muzzle velocity: 710 m (2,330 ft) per second

Specification
AKM
Calibre: 7.62 mm (0.3 in)
Length: 876 mm (34.49 in)
Length of barrel: 414 mm (16.30 in)
Weight loaded: 3.98 kg (8.77 lb)
Magazine: 30-round box
Rate of fire, cyclic: 600 rpm
Muzzle velocity: 710 m (2,330 ft) per second



The AK-47 has been manufactured throughout the Warsaw Pact countries, and this East German infantryman would be armed with the MPiKM version, made in the DDR.

Egyptian troops during the Yom Kippur War of 1973. Their weapons are AKMs with the characteristic angled muzzle attachments and the handgrip grooved into the forestock. The AKM is now the standard Egyptian service rifle.

The Assault Rifle in Guerrilla Hands

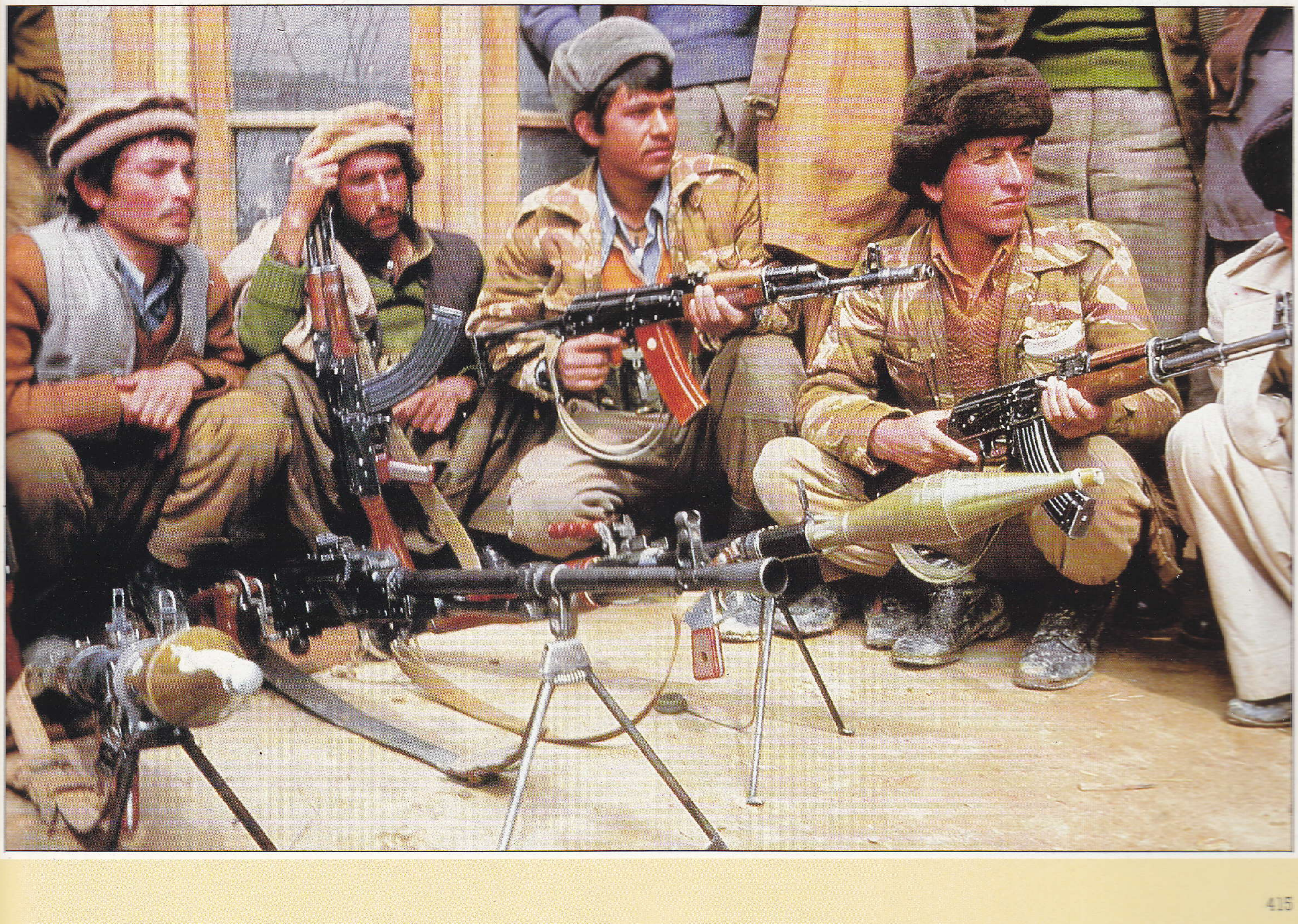
While the major powers have maintained a sometimes uneasy peace, the 40 years since the end of World War II have been far from quiet for the rest of the world. Freedom fighters, revolutionaries, terrorists and dictators have all turned to the gun as arbiter of any dispute; demand for modern weapons is ever-increasing, and the primary requirement is for individual weaponry.

In the shady war that seems to be taking place in all too many nations, the guerrilla has to use whatever weapons he can acquire. Although the urban or rural guerrilla will use whatever weapon he (or she) can lay his hands on, he will always try to adopt some form of 'standard' weapon. The advantages of such a course of action are several. One advantage is that training can be simplified, as few guerrilla organizations have time or facilities for proper training, yet modern rifles need the care and attention that cannot be ignored. Thus if one weapon type is the norm, more people can pass on the words relating to its use. Another advantage is supplies. If even a tentative supply route can be established, so can a supply of ammunition and spare parts. If several calibres are in use by any one organization the ammunition supply alone becomes complicated and uncertain. Yet another advantage of a 'standard' weapon is that it can be picked up, used and hidden by any member of the organization without the need for familiarization before every mission.

Many guerrilla movements have now virtually standardized on two types of rifle, the AK-47 (and the essentially similar AKM) and the AR-15 (the M16 or M16A1) together with its descendant the AR-18. The latter two weapons are usually lumped together as 'Armalites'. Of the two the AK-47 must be the more numerous, for it appears in locations as far separated as Belfast and Malaysia.

Exactly where all the AK-47s originate is not easy to establish. AK-47s and their many derivatives are now produced in many countries including, Poland, China, Hungary, North Korea, Yugoslavia, Romania and the many copies produced in such odd corners as Afghanistan. Of all these nations China is perhaps the most liberal in handing out the AK-47, in the version known as the Type 56, but this is an exact copy of the normal AK-47. Examples of these Chinese weapons have even turned up in Europe. But it must not be thought that all these AK-47s turn up as the result of ideological support for the guerrilla. Most appear to end up in guerrilla hands by the simple expedient of commercial transactions carried out through the armaments trade, both overt and clandestine. One nation that is known to have unloaded masses of AK-47s onto the open market is Israel; as the result of the various Middle East conflicts Israel has amassed stockpiles of captured AK-47s and these have been sold off to obtain much-needed hard currency. While

Members of a PLO guerrilla group, with a typical mix of Soviet-supplied weaponry. Visible are AK-47s and AKMs and two RPG-7 anti-tank rocket launchers. Just visible on the extreme left is an RPD, a machine-gun version of the AK-47.

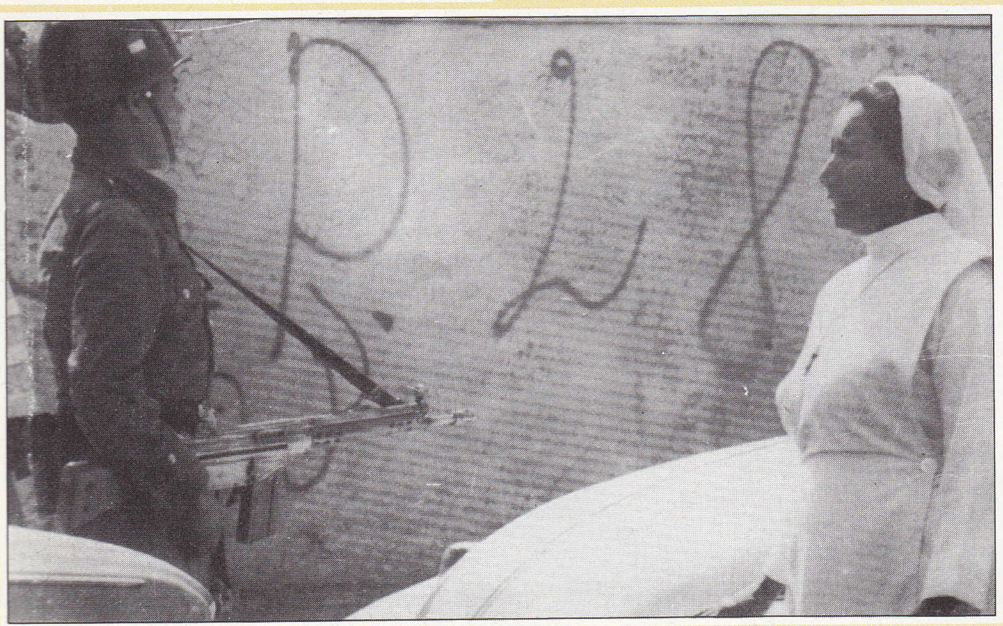


Another guerrilla group, this time in Afghanistan, displays captured weapons. The central figure holds a 5.45-mm AK-74; on the left is an AKM and on the right an AK-47. The machine-gun is a DP and the heads of two RPG-7s can be seen.

Above: A female guerrilla of the Chad Armée du Nord is trained to use an ex-Soviet AK-47; note the RPD magazine.

Left: Western Somali Liberation Front forces, armed with American 7.62-mm M14 rifles, demonstrate in the Ogaden desert.

Above: Young guerrillas in El Salvador. The boy in front is holding a Heckler und Koch G3, the second has a M16A1 and the third a FN FAL.



Left: During the tension following the assassination of Archbishop Romero of San Salvador in 1980, confrontation between the Church and the gun became more frequent.

many of these captured weapons have been purchased legally enough, many have now found their way into guerrilla hands by underground purchases with money obtained through the usual guerrilla methods of robbery and protection rackets.

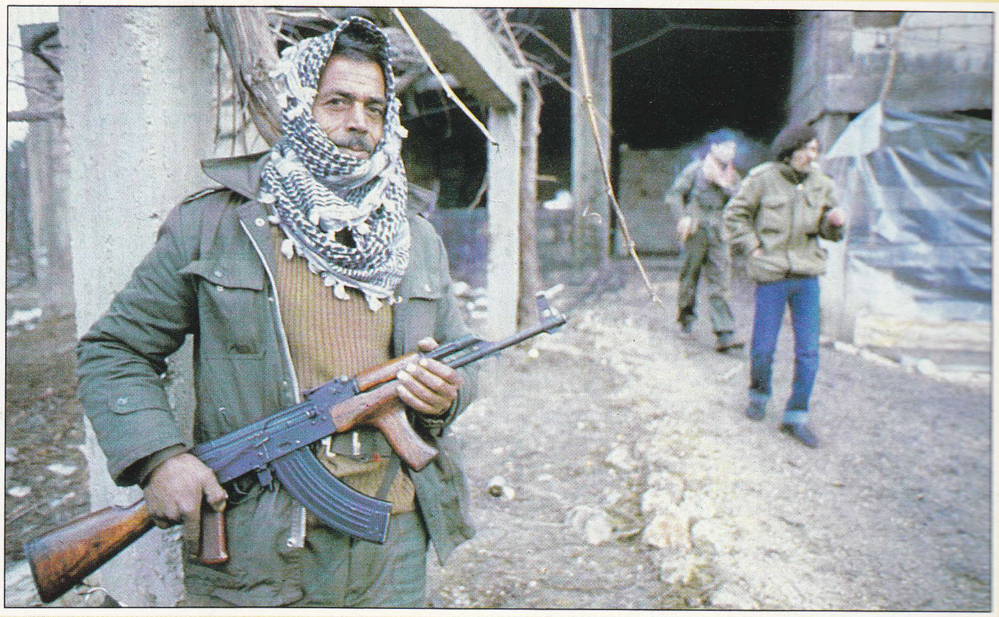
Once in guerrilla hands the AK-47 is an ideal weapon. It is robust, easy to use and at close ranges can produce lethal volumes of fire. It is also relatively easy to conceal, especially the versions with folding steel butts which can be folded down to a length of only some 700 mm (25.76 in). This length can easily be hidden under a coat or under a baby in a pram. Ammunition supply is relatively easy, for so many nations now use the AK-47 or its derivatives that some sort of supply route can be readily established; the same route could also be used for weapon supply.

With the AR-15, the usual supply route is through normal commercial supply methods. In some of the states of the USA AR-15s can be purchased quite openly with no legal restraints and the same applies to many other nations. Thus small arsenals can be built up without difficulty. Many countries have insisted on these open purchases being restricted to single-shot versions only, but any gunsmith or mechanic with a minimum of skill can usually convert such weapons to full automatic fire. Again, ammunition supply is no problem, for the 5.56-mm×45 cartridge design is based on that of a commercial hunting cartridge. Theft from arsenals is another source of Armalites, for not all armed forces treat their weapon stocks with the degree of security they require and many European guerrilla movements obtain their arms from just such sources.

While the AK-47s and the Armalites are widely used by guerrilla forces, they are not ideal for the purpose. They are far bulkier than sub-machine guns or pistols and in confined spaces less destructive than grenades or bombs. But they have great effect as morale weapons. The very sight of a guerrilla armed with an assault rifle is enough to produce panic in many situations, which is just what the guerrilla wants. The rifle is also a very effective assassination weapon at ranges far greater than those obtained by normal hand weapons such as pistols, and the urban sniper is now a well-established feature of terrorism. The Armalites have the edge over the AK-47s in this respect but both are lethal enough in trained hands.

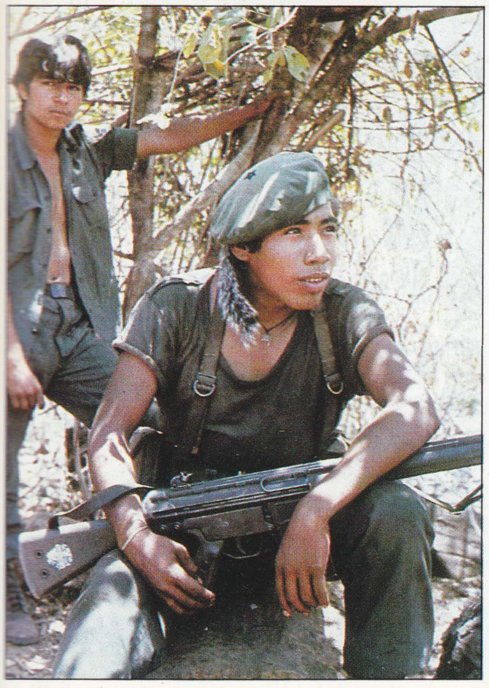
One weapon type seems likely to supplement the AK-47s and the Armalites in guerrilla hands, and that is the Heckler und Koch G3. During the Iranian revolution huge numbers of G3s were handed out to all and sundry, and few of them were ever handed back. Numbers of them are now appearing all over the world and no doubt more will appear in the future.

Above: A member of one of the South Lebanon Shi'ite militia at prayer, while a comrade with an AKM keeps watch from a Unimog 4×4 light truck.

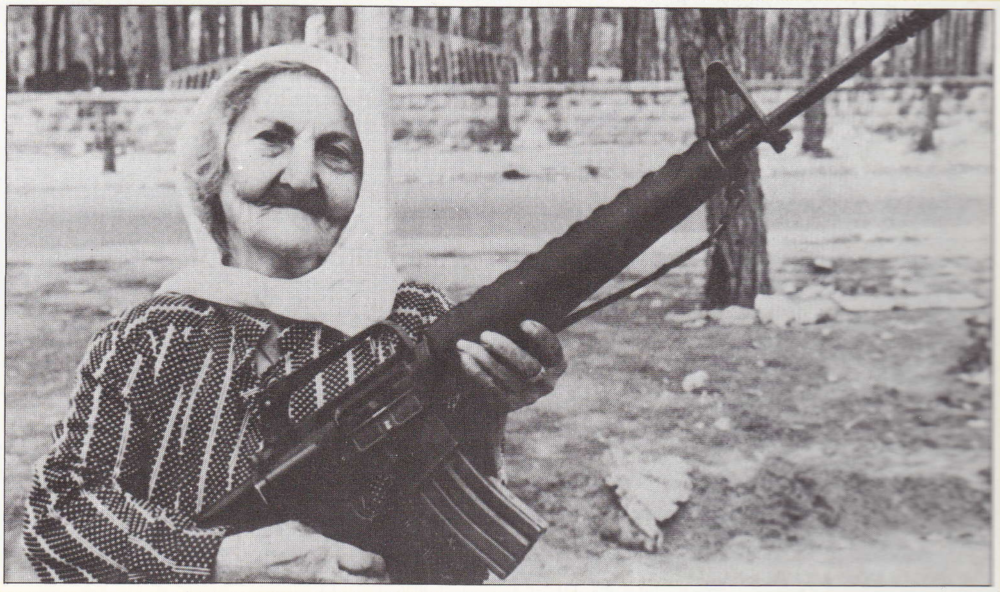


Above: The AKM carried by this PLO guerrilla in the Bekaa Valley shows by its foregrip that it was originally produced in Romania under Soviet licence.

Below: Lebanon 1983: a Lebanese army soldier surrenders to a left-wing militiaman, who is armed with an AK-47 and carries RPG-7 launchers in his pack.



Above: An El Salvador guerrilla armed with a Heckler und Koch G3, probably captured from a government soldier as it is the standard El Salvador rifle.



Right: An armed Shi'ite grandmother holding an M16 for the camera, Lebanon, 1983. The weapon is not the usual M16A1 as the bolt assist device is not fitted.

USSR

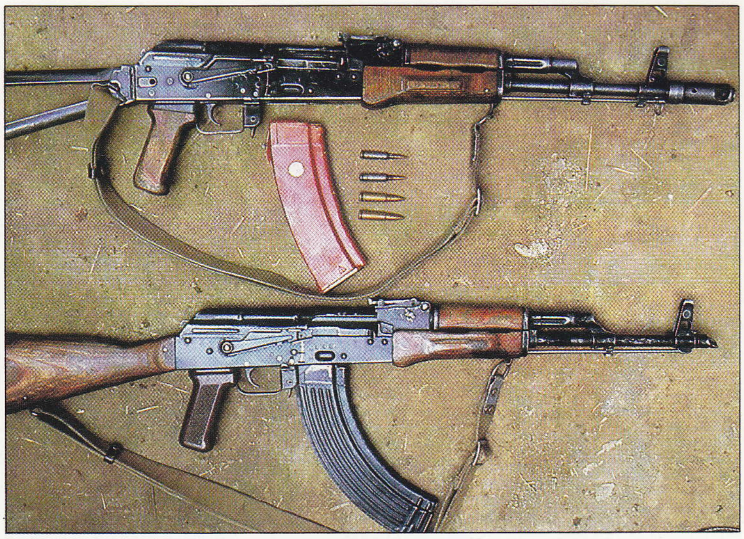
AK-74

The Soviet Union was surprisingly slow in following the Western adoption of small-calibre cartridges for its future weapon designs. Perhaps the huge numbers of AK-47s and AKMs already in service made such a change a low priority, so it was not until the early 1970s that any intimation of a new Warsaw Pact cartridge was given. In time it emerged that the new cartridge had a calibre of 5.45-mm×39 and the first examples of a new weapon to fire it were noted. In time the weapon emerged as the **AK-74**, which is now in full-scale production to meet the requirements of the Red Army; in time it can be expected that the AK-74 will be issued to other Warsaw Pact armed forces.

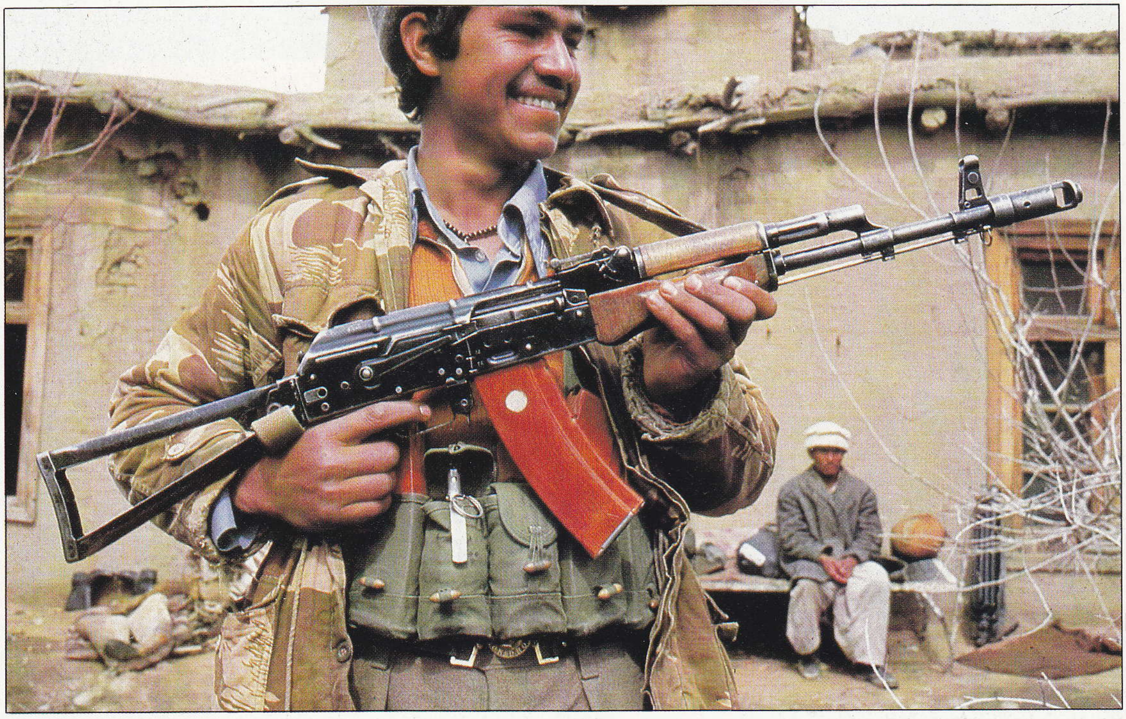
The AK-74 is nothing more than an AKM revised to suit the new cartridge. It is almost identical to the AKM in appearance, weight and overall dimensions. Some changes, such as a plastic magazine, have been introduced and there is a prominent muzzle brake. There are versions with the usual wooden stock and with a folding metal stock.

One matter relating to the AK-74 that deserves special mention is the bullet used. To gain maximum effect from the 5.45-mm calibre bullet the designers have adopted a design that is very effective but outlawed by international convention, for the steel-cored projectile has a hollow tip and the centre of gravity far to the rear. This has the effect that when the nose strikes a target the nose deforms, allowing the weight towards the rear to maintain the forward impetus and so tumble the bullet. In this way the small-calibre bullet can have an effect on a target far in excess of its cross-sectional area. Some high-velocity projectiles can display this nasty effect, but on some, such as the M193 5.56-mm cartridge, it is an unintended by-product. On the Soviet 5.45-mm the effect has been deliberately designed into the projectile. International conventions have for many years outlawed such 'Dum-Dum' bullets and its various progeny, but to date no corresponding strictures appear to have been forthcoming regarding the 5.45-mm bullet.

Specification (provisional)
Calibre: 5.45 mm (0.215 in)
Length: 930 mm (36.61 in)
Length of barrel: 400 mm (15.75 in)
Weight unloaded: 3.6 kg (7.94 lb)
Magazine: 30-round box
Rate of fire: 650 rpm
Muzzle velocity: 900 m (2,955 ft) per second



Right: An AK-74 (top), with an AK-47 for comparison beneath. The AK-74 has a skeleton butt, but note the prominent muzzle brake and the brown plastic magazine. Note also the size difference between the 5.45-mm cartridges (top) and the 7.62-mm×39 cartridges.



The AK-74 is now in wide use in the Soviet armies, and has seen service in Afghanistan, where this example was captured. It is to all intents and purposes a small calibre AKM, with many parts seeming identical.

ISRAEL/SOUTH AFRICA

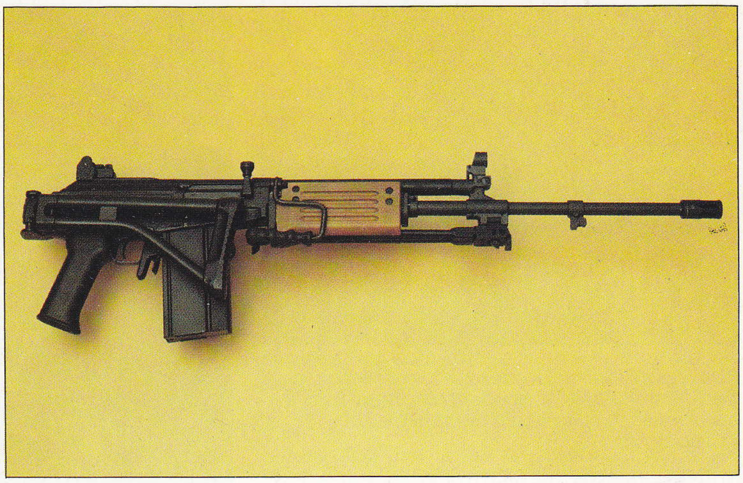
Galil and R4

The exact provenance of the **Galil** assault rifle is a trifle clouded, for although it is claimed that the design is an indigenous Israeli effort, there are some obvious likenesses to the Finnish Valmet assault rifles that were produced in a variety of models and calibres. Things are made more confused by the fact that the Valmet rifles were modelled on the Soviet AK-47. Though it would be an oversimplification to state that the Galil is an AK-47 derivative, there are some resemblances in operation (the usual rotating bolt) and general layout, but these are now common to many designs.

The Galil assault rifle has been produced in both 5.56-mm and 7.62-mm calibres, and is now one of the most widely used weapons issued to the various Israeli armed forces. It is produced in three forms: one is known as the **Galil ARM**, which has a bipod and a carrying handle and is the all-purpose weapon; another is the **Galil AR**, which lacks the bipod and handle; and the third is the **Galil SAR**, which has a shorter barrel and no bipod or carrying handle. All three having folding stocks. The bipod on the ARM can be used as a barbed wire cutter, and all three versions have a bottle cap opener fitted as standard to prevent soldiers using other parts of the weapon as bottle openers (eg the magazine lips). A fixture over the muzzle acts as a rifle grenade launcher.

In its full ARM version the Galil can be used as a form of light machine-gun and 35- and 50-round magazines are produced; there is also a special 10-round magazine used to contain the special cartridges for launching rifle grenades. As usual a bayonet can be fitted.

The Galil has proved to be very effective in action and has attracted a great deal of overseas attention. Some

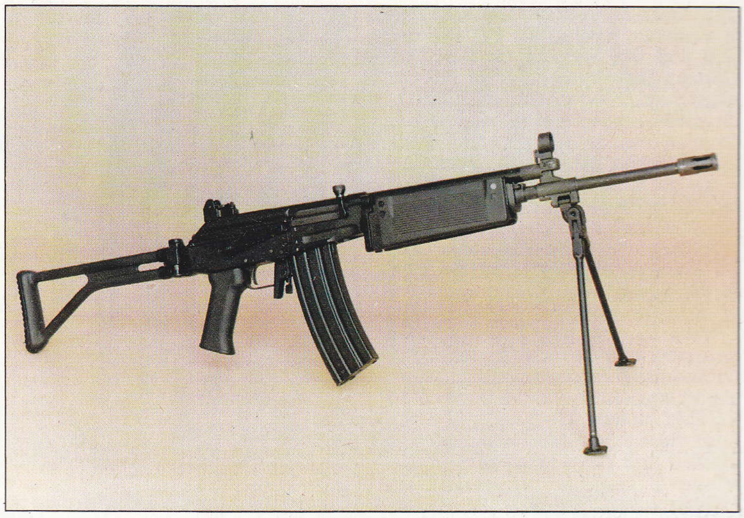


Israeli Galil SAR (short assault rifle) with the metal stock folded forward to reduce the length. This version cannot be used to fire rifle grenades and does not have the bipod fitted to the longer models. It can be found calibrated for 5.56-mm and 7.62-mm ammunition.

have been exported and the design has also been copied – the Swedish 5.56-mm **FFV 890C** is obviously based on the Galil. One nation that negotiated licence production was South Africa, and its version is the **R4**, now the standard rifle for the front-line units of the South African defence forces. The R4 is produced in 5.56-mm calibre and differs in some details from the original, the changes resulting mainly from operational experience in the South African and Namibian bush. The R4 has also been exported to some unspecified countries.

Specification
Galil 5.56-mm ARM
Calibre: 5.56 mm (0.22 in)
Length: 979 mm (38.54 in)
Length of barrel: 460 mm (18.1 in)
Weight loaded: 4.62 kg (10.19 lb) with 35-round magazine
Magazine: 35- or 50-round boxes
Rate of fire, cyclic: 650 rpm
Muzzle velocity: 980 m (3,215 ft) per second

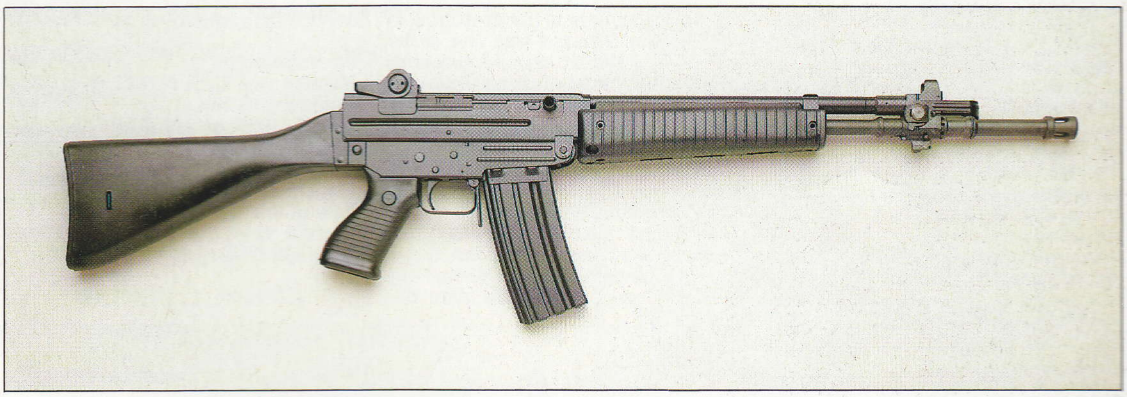
Specification
Galil 7.62-mm ARM
Calibre: 7.62 mm (0.3 in)
Length: 1050 mm (41.34 in)
Length of barrel: 533 mm (20.98 in)
Weight loaded: 4.67 kg (10.30 lb)
Magazine: 20-round box
Rate of fire, cyclic: 650 rpm
Muzzle velocity: 850 m (2,790 ft) per second



South Africa has adopted a modified form of the Galil as the new standard weapon of the Defence Forces: the R4 has been strengthened to withstand the rigours of the bush. The bipod is fitted as standard.

ITALY

Beretta AR70



The Beretta AR70 assault rifle, fitted with a 20-round magazine showing the clean overall lines and good finish. It is used by some Italian anti-guerrilla special units and has been sold in Jordan and Malaysia, but large-scale sales have yet to be made.

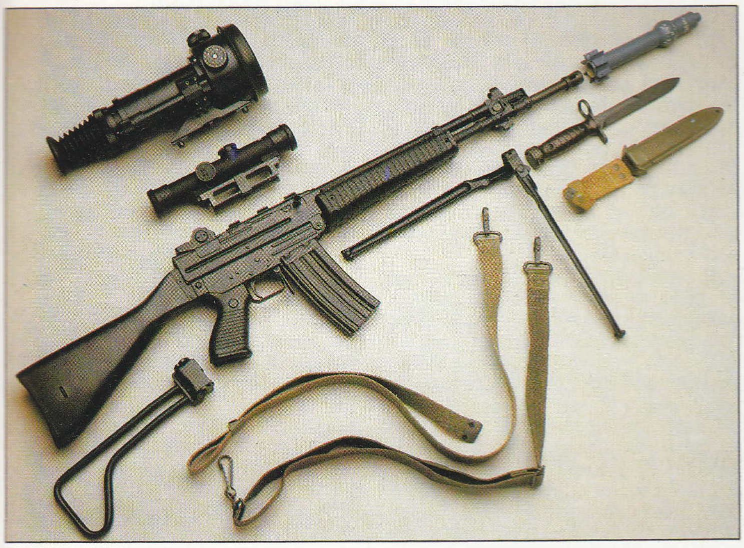
The **Beretta AR70** was developed following a series of manufacturer's in-house trials involving several types of assault rifle designs, and from these evolved a gas-operated design using the rotary bolt locking principle but in a very simple form. For increased safety Beretta decided to strengthen the locking system with extra metal around the chamber area. The result is a functional and well-made weapon that can be stripped down into its few operating parts with ease.

There are three production versions of the AR70: one is the AR70 proper, which has a nylonite stock and furniture; another is the **SC70**, which has a folding butt constructed from shaped steel tubing; and the **SC70 Short** is a version of the SC70 with a shorter barrel for special troops. The AR70 and SC70 can be used to fire 40-mm rifle grenades; the SC70 Short cannot be used in this capacity.

The AR70 is as good as any assault rifle on the market, and considering the care with which Beretta design and manufacture weapons it should be a certain success. For some reason it has yet to make any large impact. Small numbers have been adopted by the Italian special forces and some have been exported to Jordan and Malaysia, but the numbers involved have not been large. This is rendered even more odd when it is realized that the care in design and construction is such that the AR70 is a very accurate weapon, accurate enough for a telescopic sight to be fitted to standard production versions if required. The AR70 is still being advertised and marketed so it may yet emerge as the important weapon type it deserves to be.

Specification
AR70
Calibre: 5.56 mm (0.22 in)
Length: 955 mm (37.60 in)
Length of barrel: 450 mm (17.72 in)
Weight loaded: 4.15 kg (9.15 lb)
Magazine: 30-round box
Rate of fire, cyclic: 650 rpm
Muzzle velocity: 950 m (3,115 ft) per second

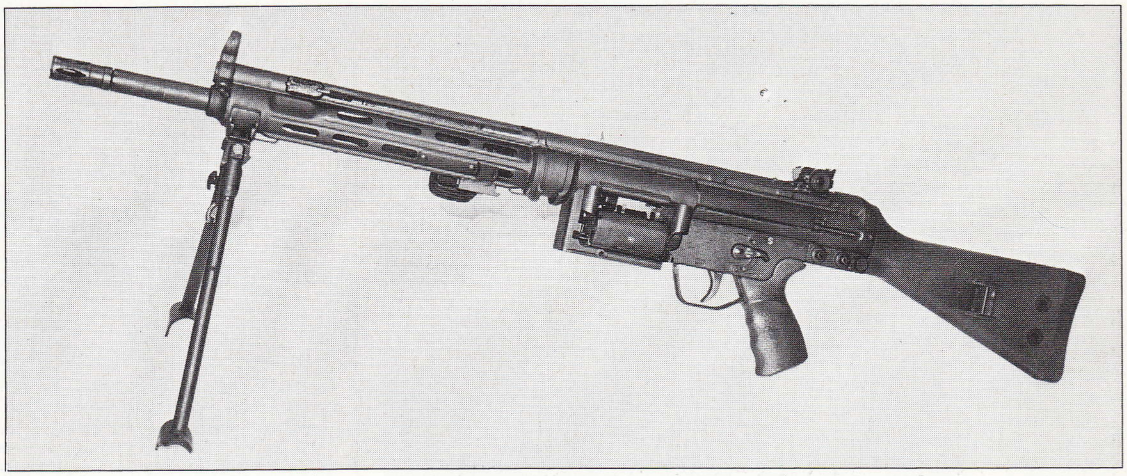
The AR70 has several equipment options, including the fitting of night sights, a bayonet or a MECAR rifle grenade. The butt is relatively easy to remove and replace with a skeleton butt to convert the rifle to SC70 standard.



The Beretta AR70 in service in the Malaysian jungles; note the applied camouflage paint scheme. The AR70 weighs only 4.15 kg loaded with 30 rounds and is thus a fairly handy weapon for the small-statured Asian races to handle, but they have begun to use the M16.

WEST GERMANY

Heckler und Koch G3



The Heckler und Koch HK 21, a 7-62-mm light machine-gun version of the basic G3. This version uses a belt feed which can be altered to take a 20-round box magazine if required. This model is produced in Portugal and has been widely sold in Africa.

The **Heckler und Koch G3** assault rifle is a development of the CETME design and was adopted by the West German Bundeswehr during 1959. In many ways it has proved to be one of the most successful of all the post-war German weapon designs and it is still in production not only in West Germany but in numerous other countries which have produced their own weapons under licence.

Although the makers would not like it to be said, the Heckler und Koch G3 is the nearest that designers have come to the use-and-throw-away rifle. Despite the cost the G3 is a weapon designed from the outset for mass production using as much simple machinery as is possible. On the basis of the CETME design Heckler und Koch have developed the design so that plastics and pressed steel are used wherever possible. The ex-CETME locking roller system is retained to provide a form of delayed blow-back when firing.

There is a general resemblance to the FN FAL in the G3 but there are many differences. The G3 is a whole generation ahead of the FN FAL, and this is reflected not only in the general construction and materials but also in the development of a whole family of variants based on the basic G3. There are carbine versions, some with barrels so short they could qualify as submachine guns, sniper variants, light machine-gun versions with bipods and heavy barrels and so on. There is also a version for use with airborne or other such troops: this is the **G3A4**, which has a butt that telescopes onto either side of the receiver.

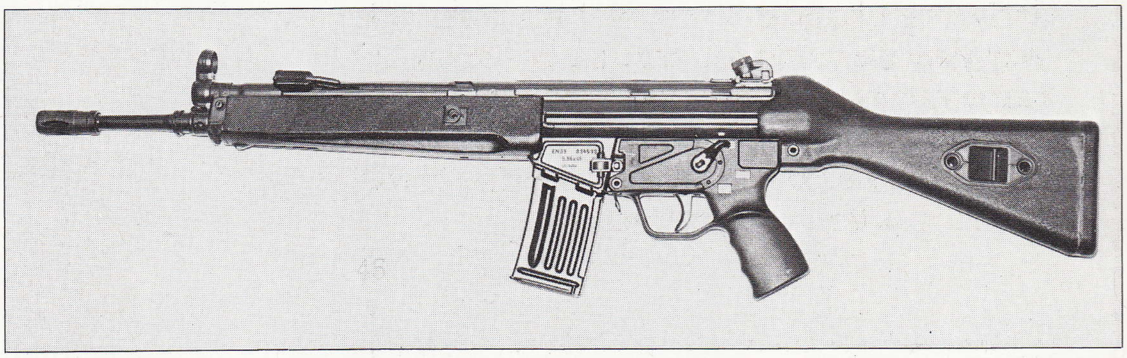
For all its overall simplicity the G3 has some unusual features. One is the bolt, which is so designed that it locks with the bulk of its mass forward and over the chamber to act as an extra mass to move when unlocking. Stripping is very simple and there are only a very few moving parts. With very few changes the basic G3 can be produced with a calibre of 5.56 mm and this version is already in production as the **Heckler und Koch HK 33.**

The success of the G3 can be seen in the number of nations that have adopted the type. There are to date no fewer than 48, and of these 13 produce their own weapons under licence. The G3 was prominent in the overthrow of the Shah in Iran and was one of the weapons obtained despite sanctions by Rhodesia when defying the world before the establishment of Zimbabwe. Some nations find it profitable to produce the G3 under licence for further export sales. Into this category have come France and the United Kingdom. In many ways the G3 can be regarded as one of the most important of all modern assault rifles, but it uses the over-powerful NATO 7.62-mm×51 cartridge, in common with other designs such as the FN FAL. Despite this it remains a popular assault rifle and one that will remain in production and service for years to come.

Specification

Heckler und Koch G3A3
Calibre: 7.62 mm (0.3 in)
Length: 1025 mm (40.35 in)
Length of barrel: 450 mm (17.72 in)
Weight loaded: 5.025 kg (11.08 lb)
Magazine: 20-round box
Rate of fire, cyclic: 500-600 rpm
Muzzle velocity: 780-800 m (2,560-2,625 ft) per second

Using the same basic layout as the G3, this 5.56-mm version is known as the HK 33. It can take 20- or 40-round magazines and exists in several versions, including a special sniper's rifle and a version with a telescopic folding butt. Most versions can fire rifle grenades.



WEST GERMANY

Heckler und Koch G11

With the **Heckler und Koch G11** the way ahead in small-arms design can be seen. Although it is still not yet fully developed, the G11 has taken a great step forward in the concepts of small-arms design to such an extent that it might even be described as revolutionary.

The G11 is unusual in many ways but at the heart of it all there is the ammunition, which is caseless. Caseless ammunition has been tried in the past but Heckler und Koch appear to have been able to make it work. It took much development before the new round emerged as a rectangular block of propellant with the 4.7-mm calibre bullet projecting from one end. When fired, all the propellant is consumed within the chamber, leaving no case to eject. The propellant in its final form is sensitive enough to fire but not so sensitive that it will 'cook-off' from the chamber temperature after a period of firing.

Having developed the caseless ammunition Heckler und Koch have now developed a rifle to use it. This is the G11, a very unusual weapon indeed. In appearance it is quite unlike anything else of its kind. The entire rifle, including the barrel, is enclosed in a smooth outer casing with a combination optical sight/carrying handle above and a pistol grip and trigger beneath. There are no projections or apparent holes through which dirt and debris can enter (other than the muzzle) and the only control is a rotary disc set into the butt. This disc, or knob, is the only clue to the G11's mechanism, which is unique. Very basically, the caseless rounds are fed vertically downwards into a rotary device which turns in line with the barrel for firing and then rotates back for the next round. The rounds are packed inside sealed magazines each holding 50 rounds. These magazines are slipped into the rifle over the barrel so there is no way debris can get into them, and once their contents have been fired they are simply removed and discarded. In this way the G11 gets over the disadvantages of the reusable magazine, and another possible cause of feed problems is removed. If a round fails to fire the misfire is cleared by rotating the rotary disc by hand. This opens an ejection port which is closed again once the clearing operation is complete.

A simple switch by the trigger can be used to select either single-shot, automatic or three-round bursts. Using the last, the G11 can fire up to 2,000 rpm (cyclic) and the rate of the burst is such that it sounds like a single round being fired.

There are still many features of the G11 about which details have yet to be released. The exact method of operating the rotating ammunition feed/bolt has yet to be fully explained and many of the composition details of the propellant are being maintained as commercial secrets. Development is still continuing and it may be some time before the G11 emerges as a fully operational weapon, but the West German armed forces are watching progress closely and may even delay their adoption of the new NATO 5.56-mm SS109 round in favour of the new concept.

Specification

Calibre: 4.7 mm (0.185 in)
Length: 750 mm (29.53 in)
Length of barrel: 540 mm (21.26 in)
Weight loaded with 100 rounds: 4.5 kg (9.92 lb)
Magazine: 50-round sealed strip
Rate of fire: 600 rpm (cyclic, automatic) or 2,000 rpm (cyclic, three-round bursts)
Muzzle velocity: (estimated) 930 m (3,050 ft) per second